VOLUME XLV NUMBER FOUR

THE NATIONAL GEOGRAPHIC MAGAZINE

APRIL, 1924

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TO carry out the purposes for which it was founded thirty-six years ago, the National Geographic Society publishes this Magazine. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resultant given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purchase was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings and whose customs, ceremonies, and name have been engulfed in an oblivion.

THE Society also is maintaining expeditions in the unknown area adjacent to the San Juan River in southeastern Utah, and in Yunnan, Kweichow, and Kansu, China—all regions virgin to scientific study.

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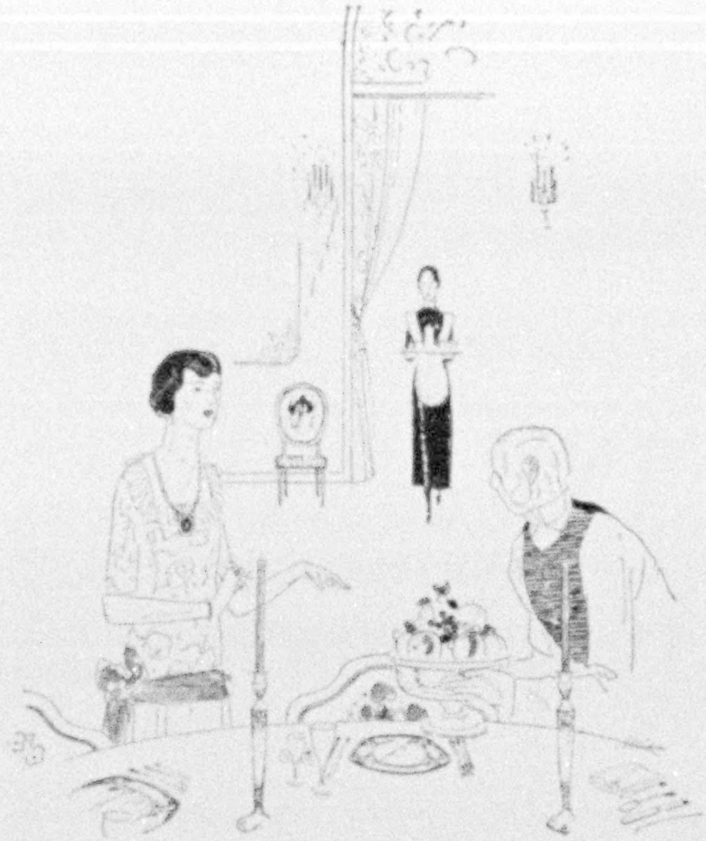

SCENE: She decides her table should say "Distinguished simplicity." So she tries changing linens—adding China—subtracting it. In despair, she faces the reality. The trouble is with the silverware. She can't cover it up, or dispense with it. It WILL dominate. And to get distinguished simplicity, that effect must exist, first of all in the silverware.

* * *

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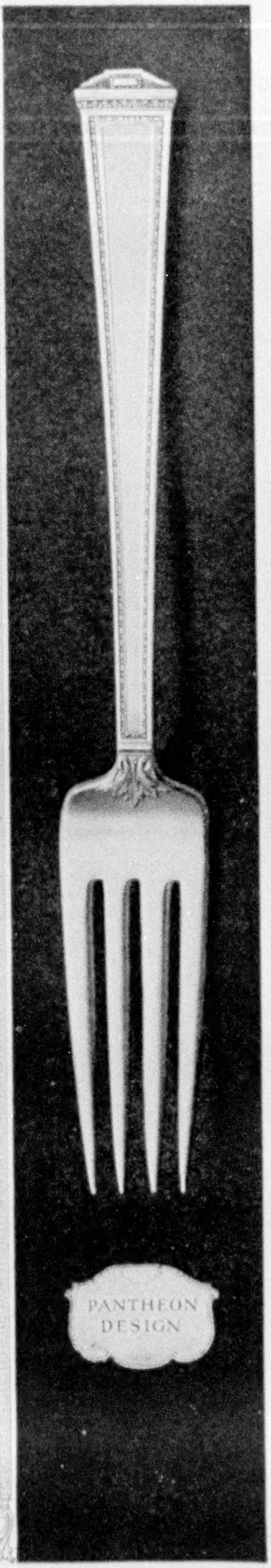

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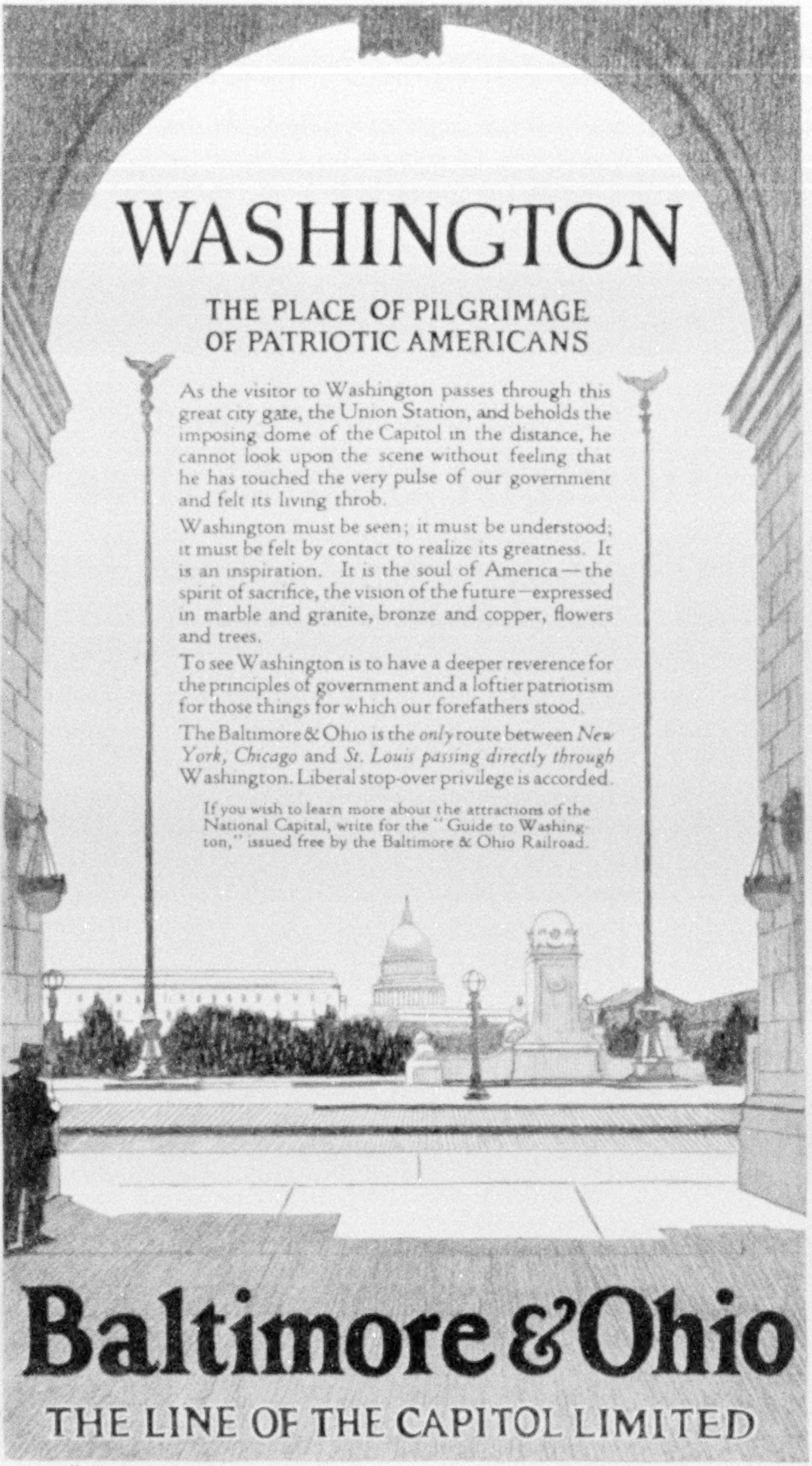

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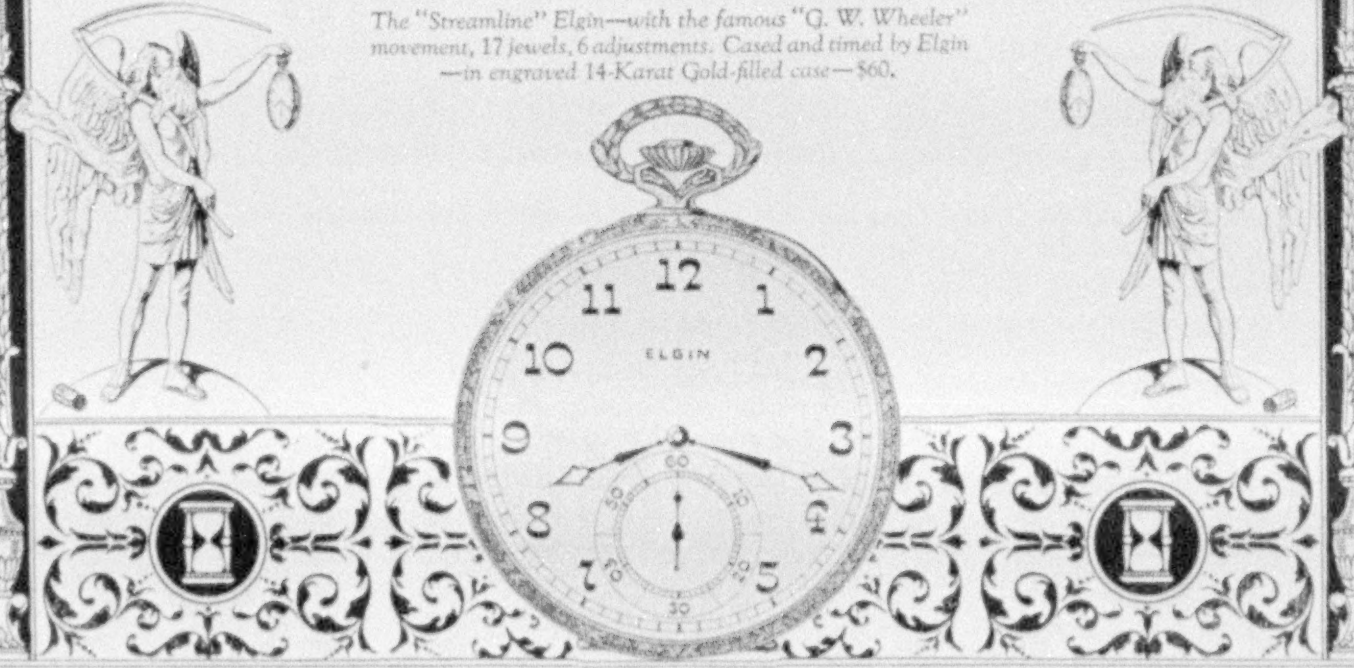

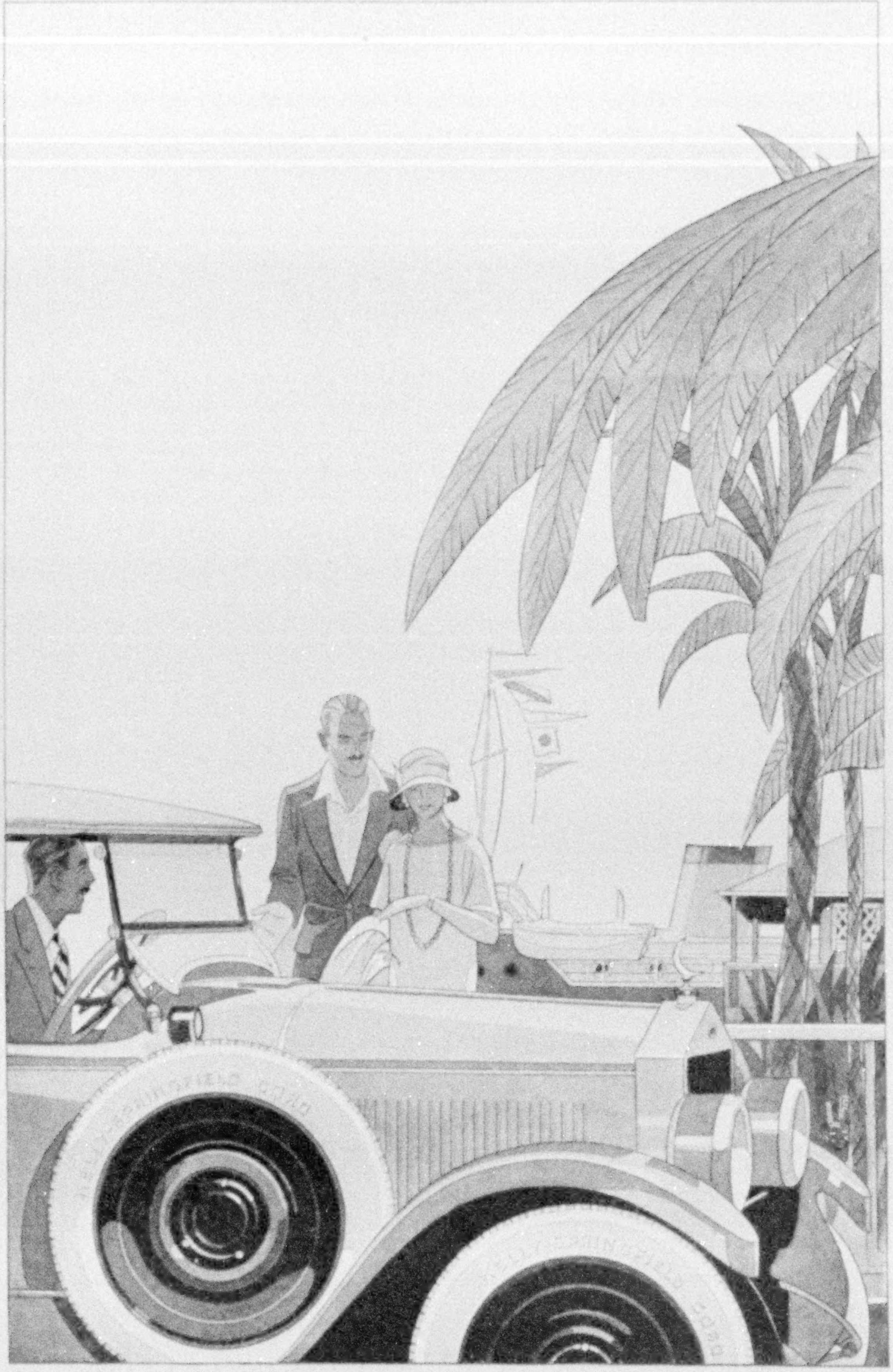

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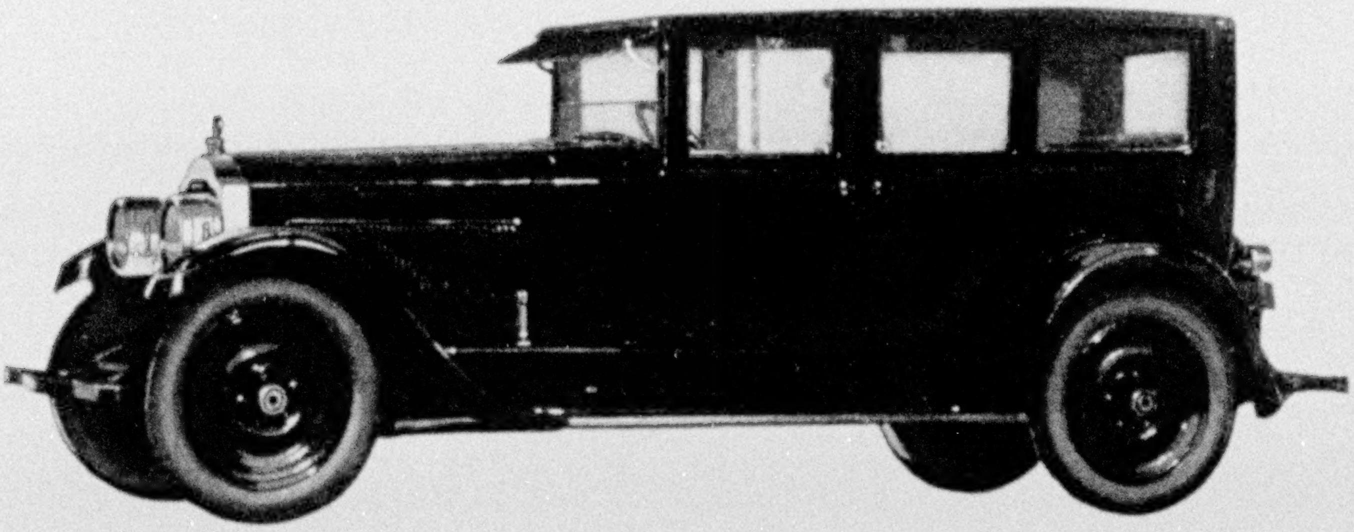

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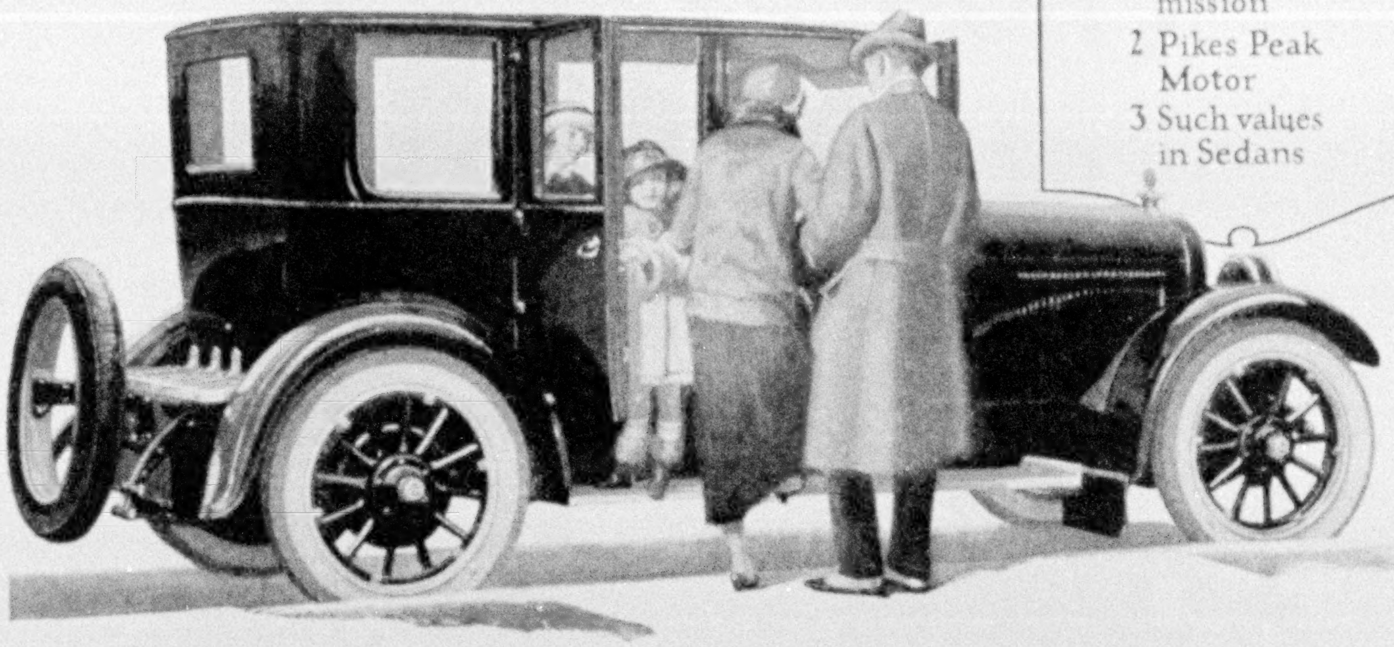

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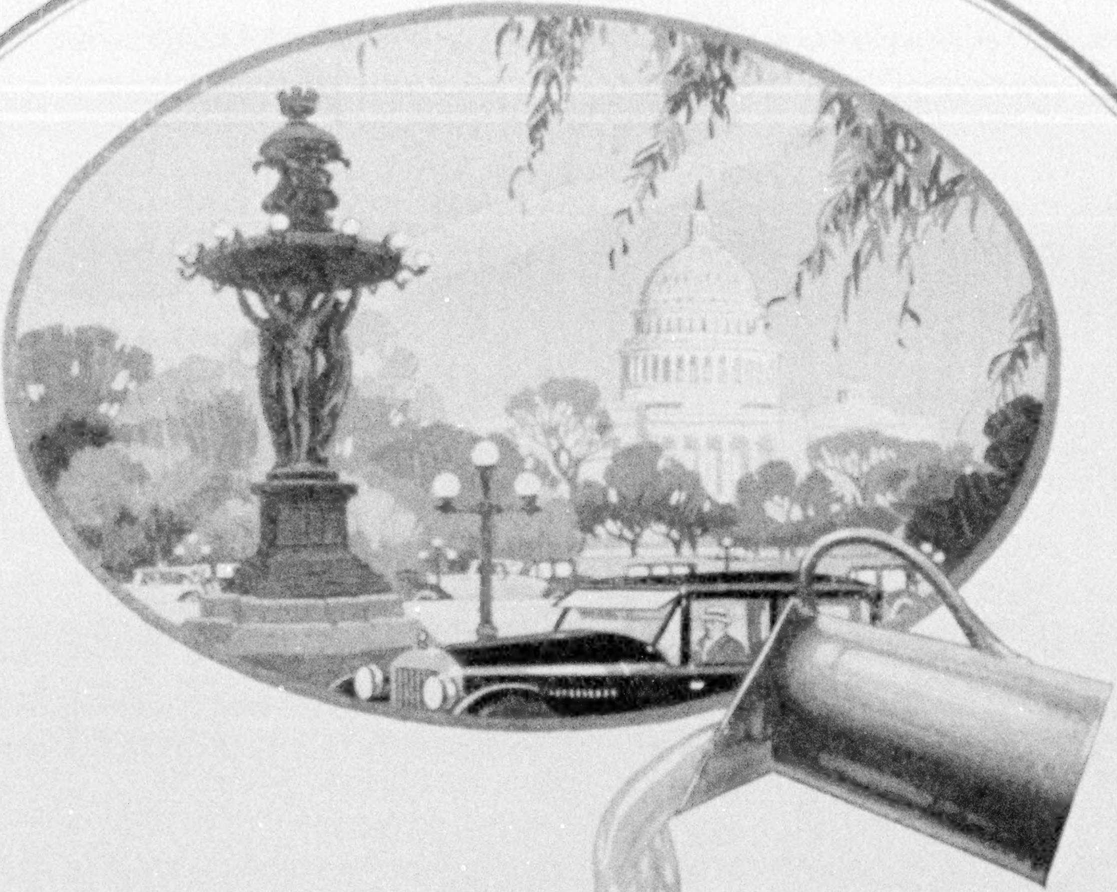

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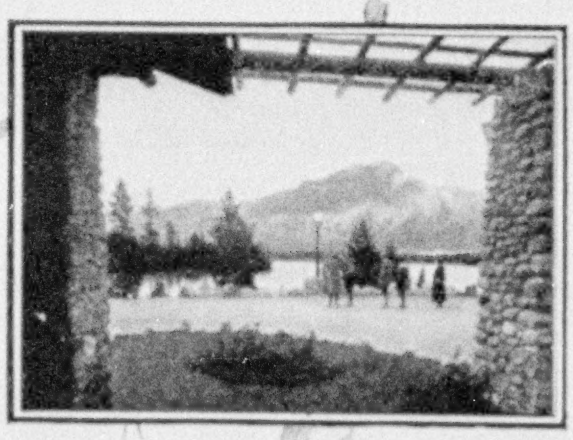

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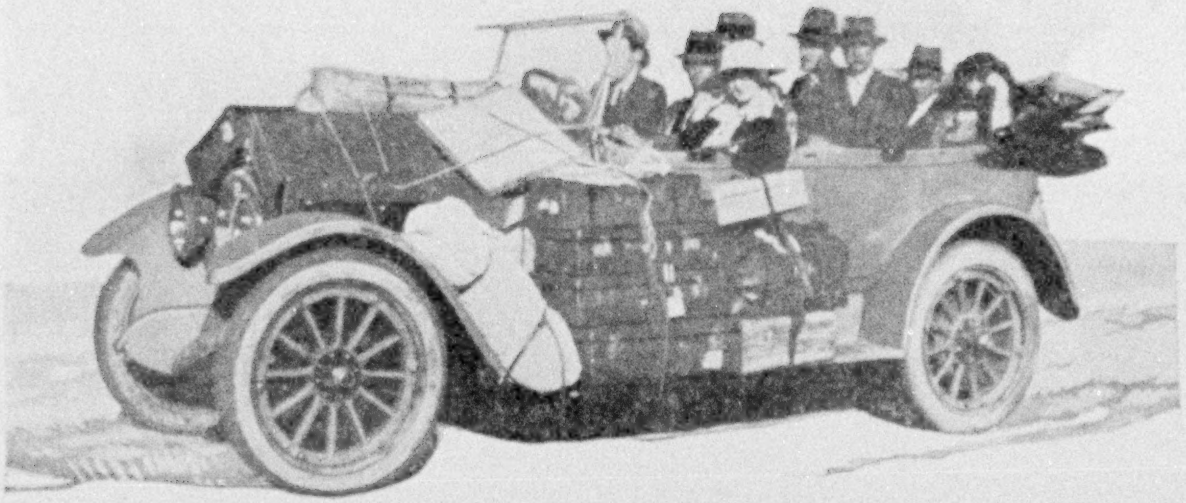

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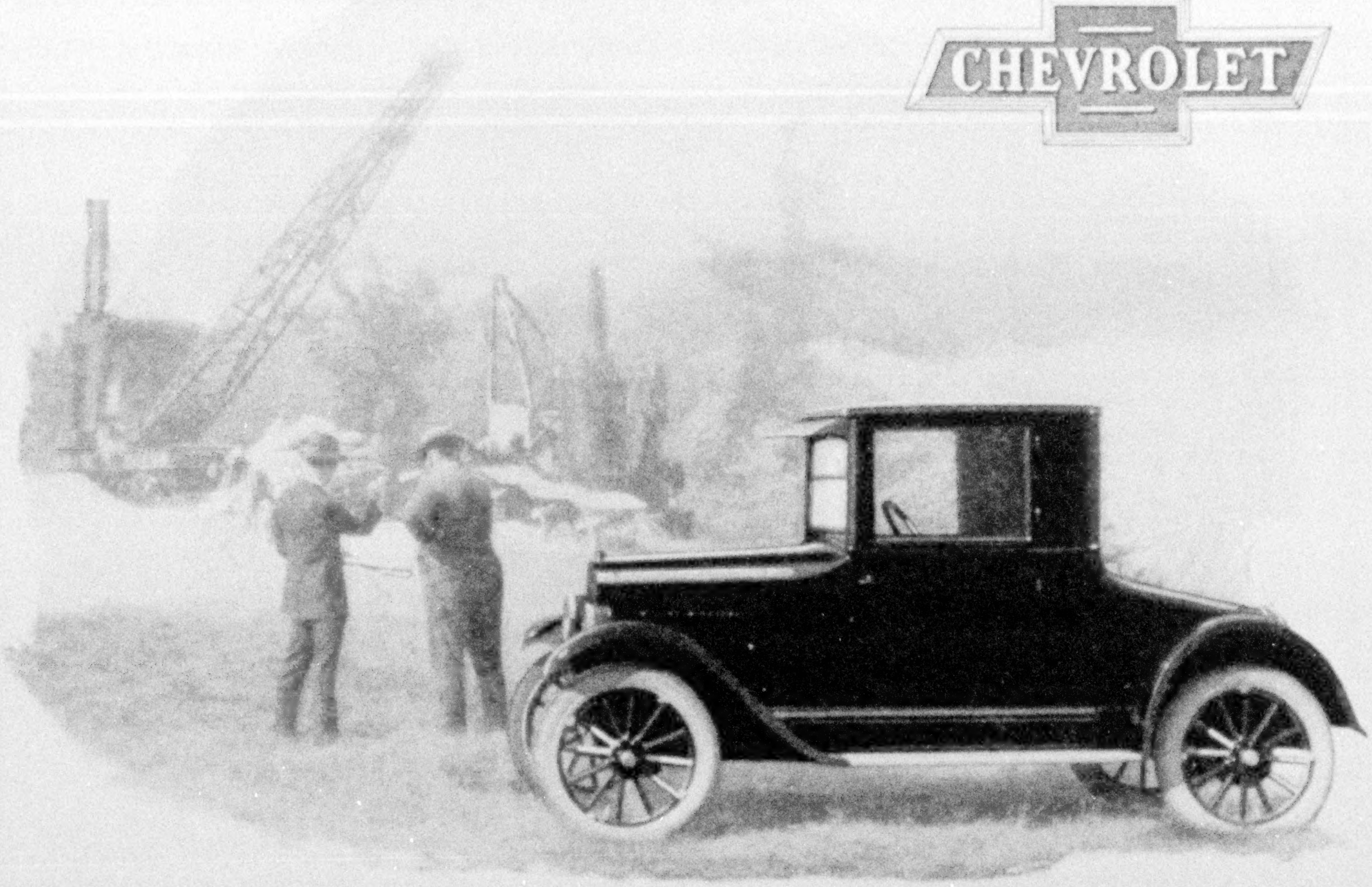

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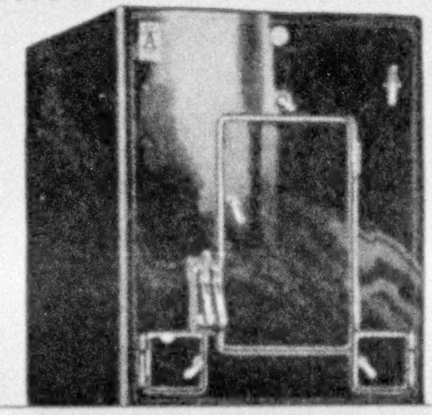

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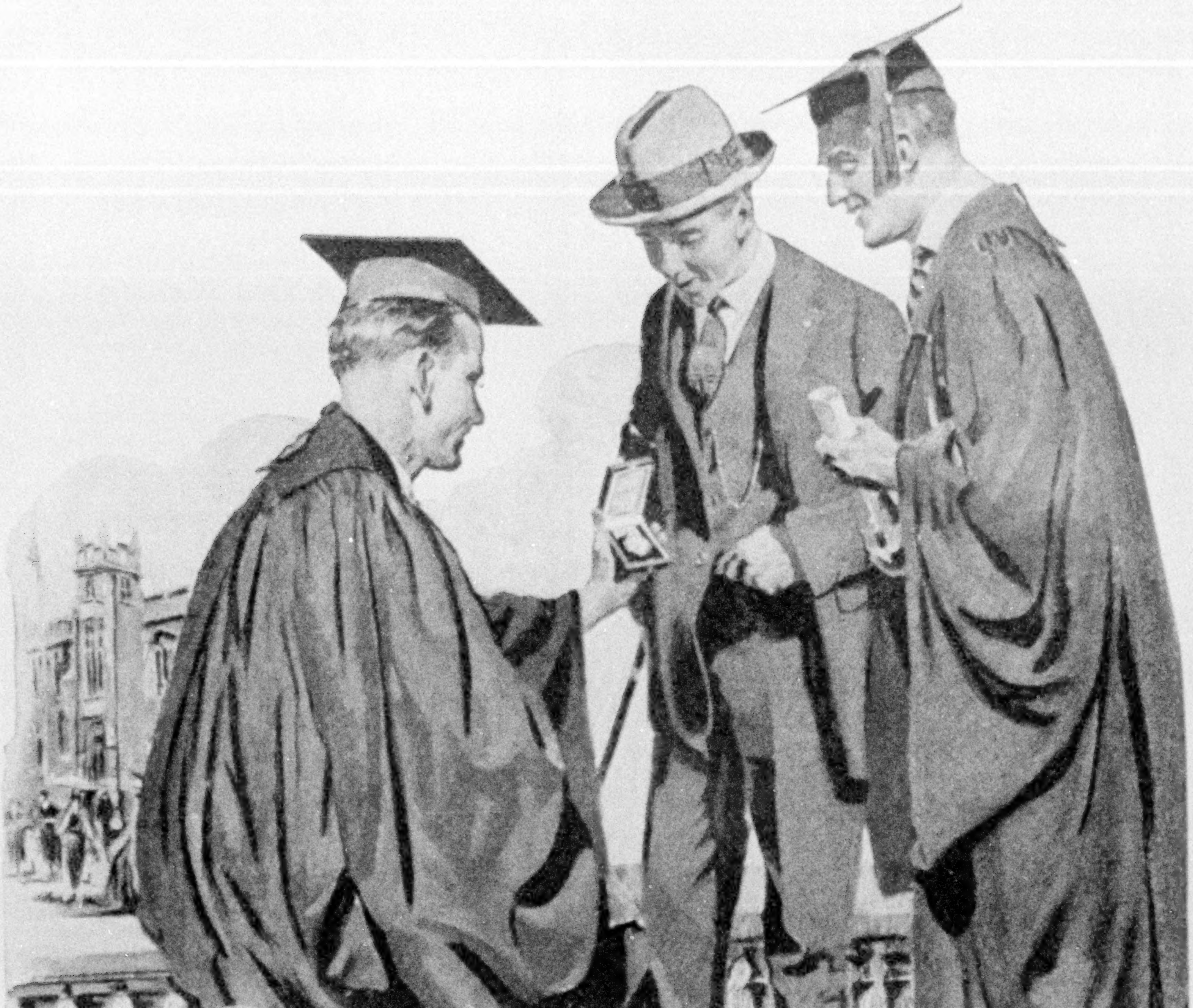

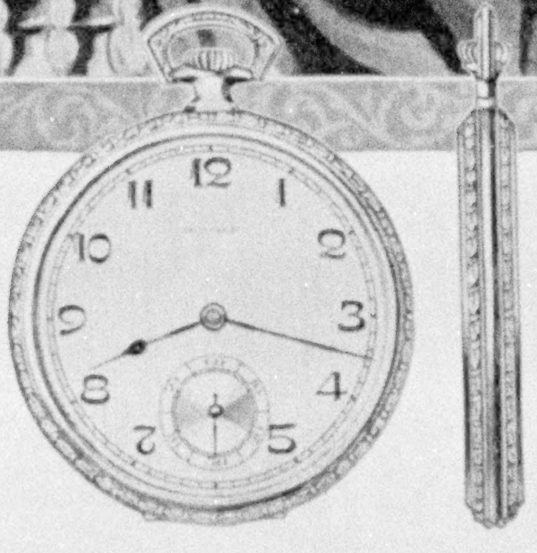

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"THE old boy's not extravagant—doesn't exactly throw money around—but when he *does* give anything, it's the best; it's good for a lifetime."

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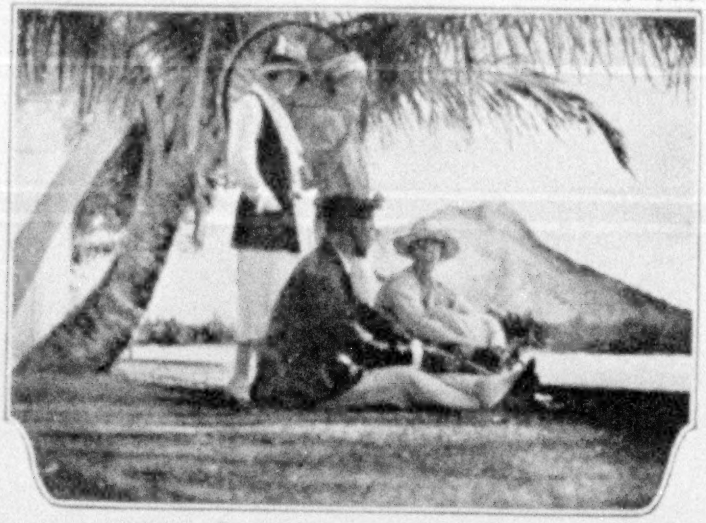

New ways to Rest & Play in HAWAII

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You'll stay longer if you can, for Hawaii is all you have pictured it—a place to laze away the ideal days, or indulge an increased energy in the surf-riding, swimming and aquatic sports at Waikiki, exploring strange tropic trails, or trolling for the plentiful and rare-colored game fish that haunt the island waters.

Bring your golf clubs for the glorious mornings and afternoons on perfect courses in a perfect climate. Shop through the treasures of quaint Oriental bazaars. Motor almost to the rim of Kilauea Volcano, in Hawaii National Park, and watch in reassuring safety the never-ceasing orgy of the fire-imps in its stupendous crater.

With all its fascination of the South Seas, Hawaii is a part of the United States, with the same laws, language, customs, conveniences.

Ask your nearest travel, railway or steamship agency for information now. The Hawaii Tourist Bureau, a public organization maintained by the people and government of the Islands for the distribution of information, offers you its services in planning as well as in enjoying your always-to-be-remembered holiday in the South Seas.

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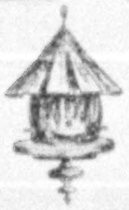

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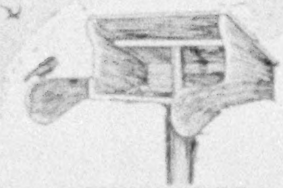

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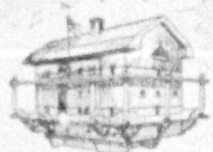

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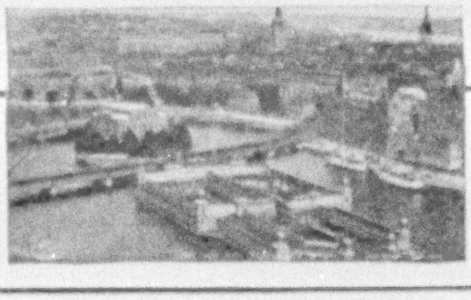

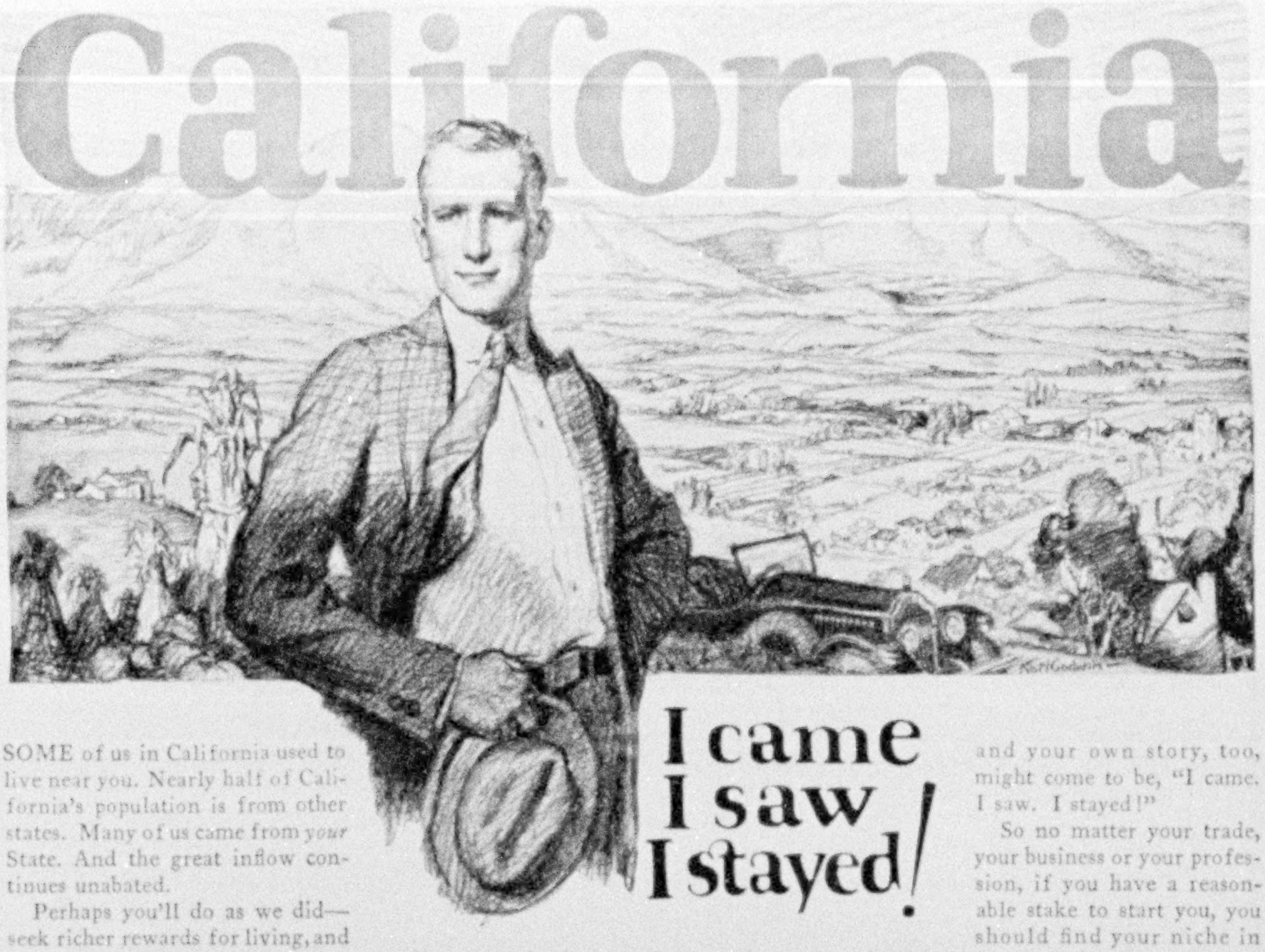

I came I saw I stayed!

SOME of us in California used to live near you. Nearly half of California's population is from other states. Many of us came from *your* State. And the great inflow continues unabated.

Perhaps you'll do as we did—seek richer rewards for living, and come to California. Perhaps you'll come as many of us did—to enjoy kind climate and the greater opportunities of a vast new empire. Or for your children's sake—that they may grow their best, having unusual educational advantages.

Whatever your reasons, you'll find your footing soon. You'll find friendly people here, intent on molding finer futures out of happier, brighter days.

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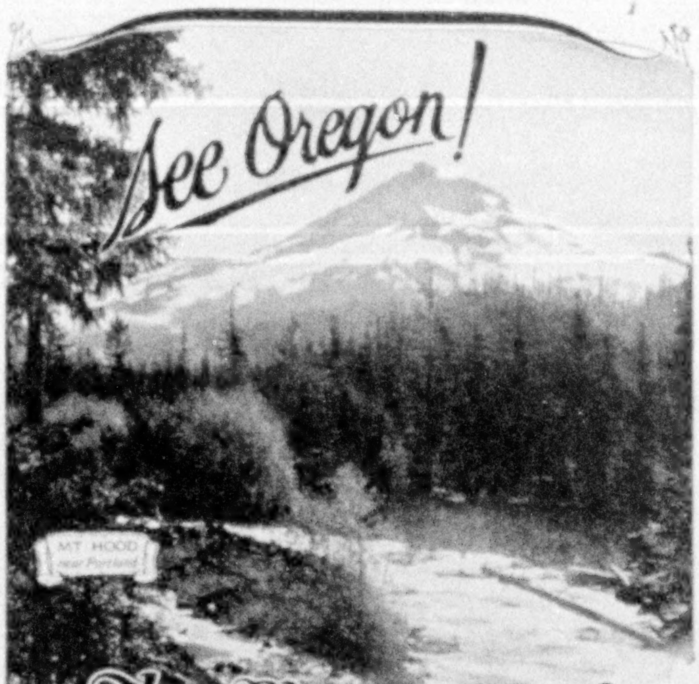

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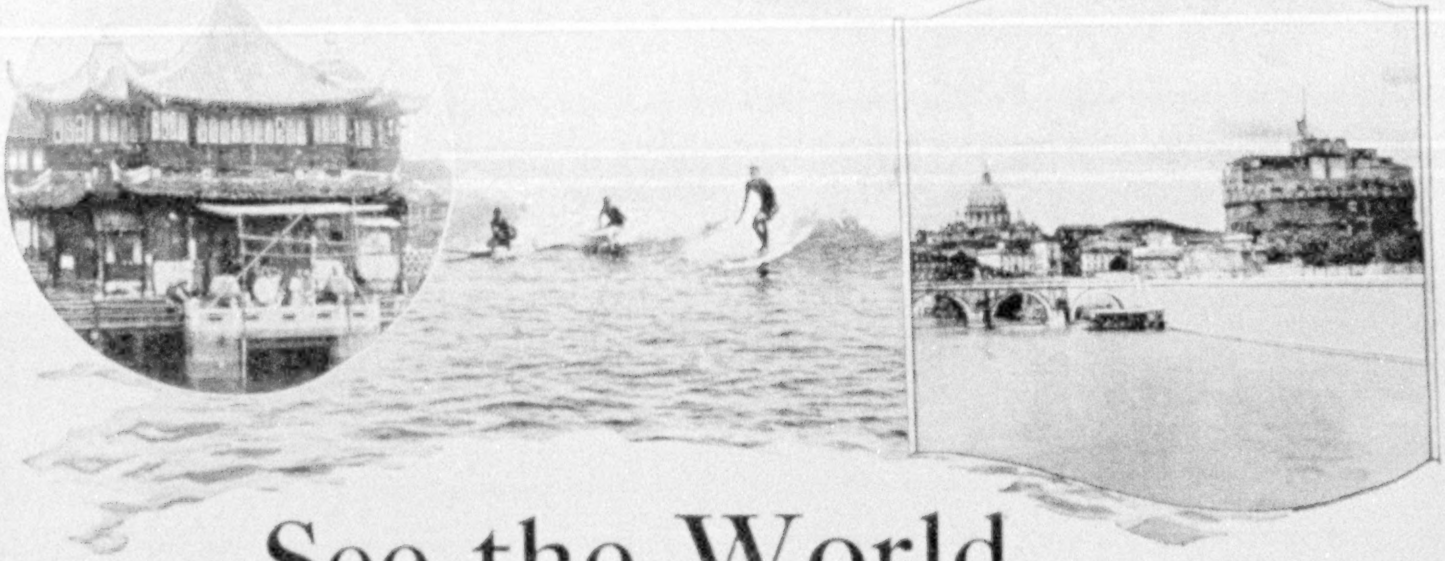

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or any part of it you choose by this new service which offers rare advantages for business or pleasure trips—speedy inter-port service—optional stop-overs—regular fortnightly schedules

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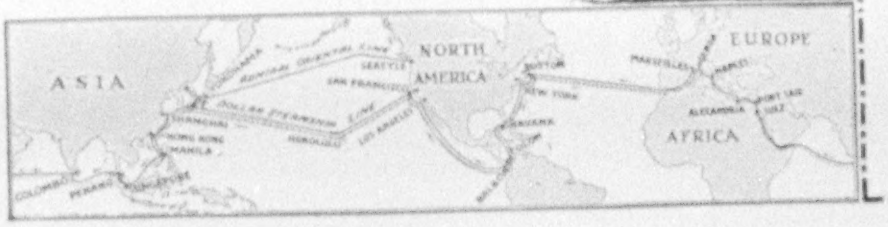

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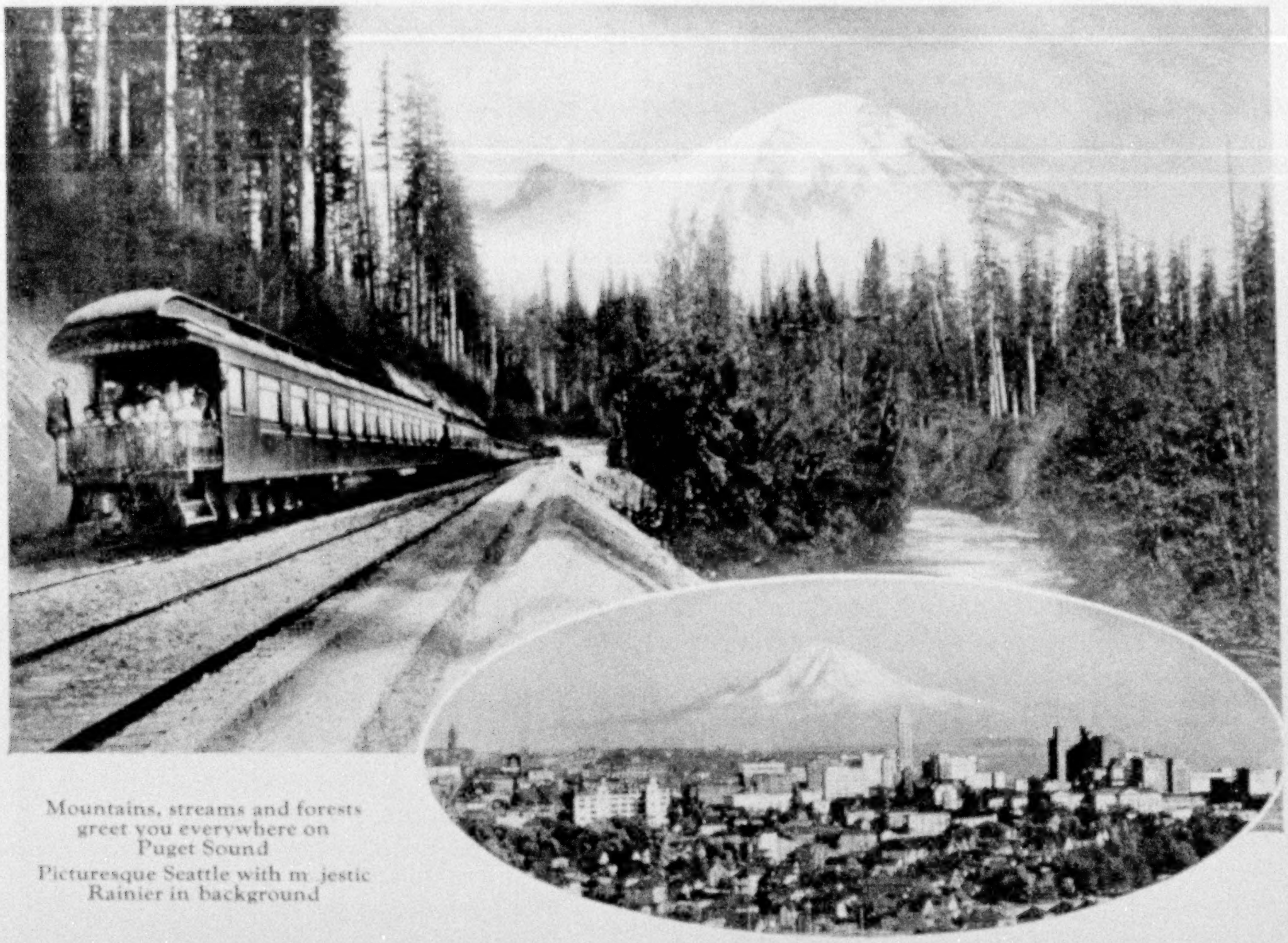

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ST. LOUIS	■	37"
KANSAS CITY	■	37"
PHILADELPHIA	■	41"
BOSTON	■	43"
NEW YORK	■	44"

Maximum temperature, 1923
June, 85; July, 88; August, 86
Average mean minimum
Dec., Jan., Feb., 36 above zero

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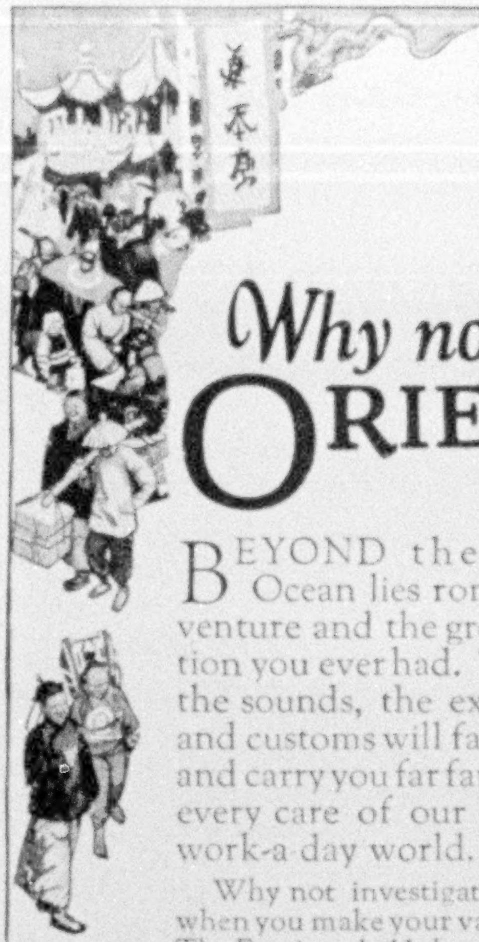

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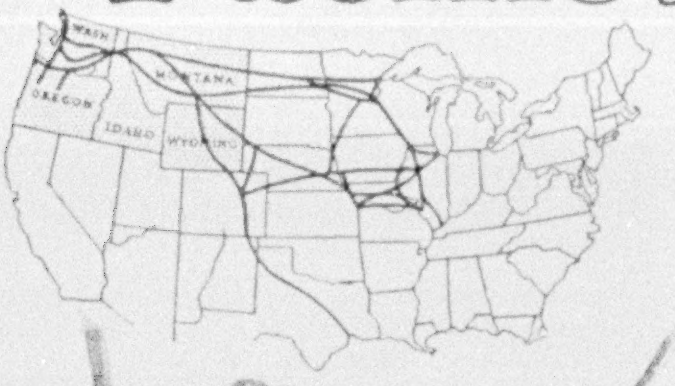

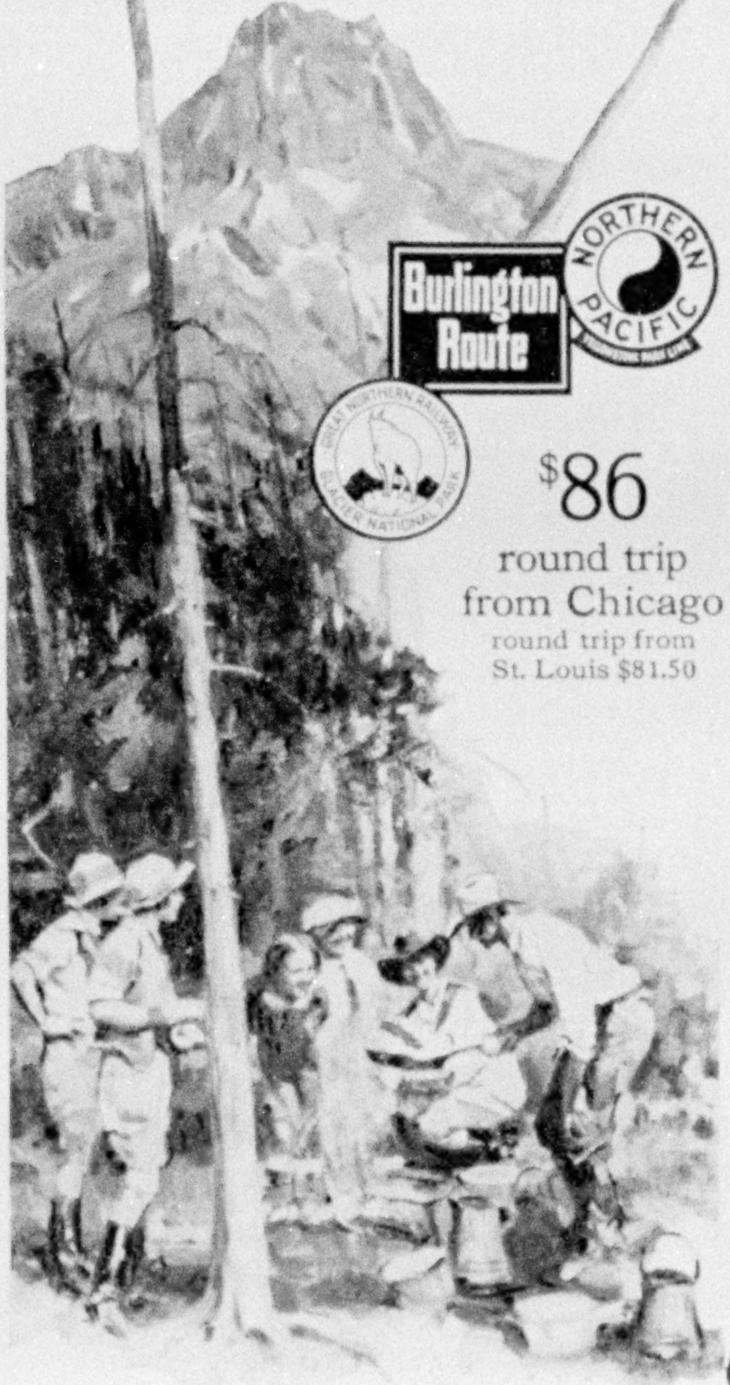

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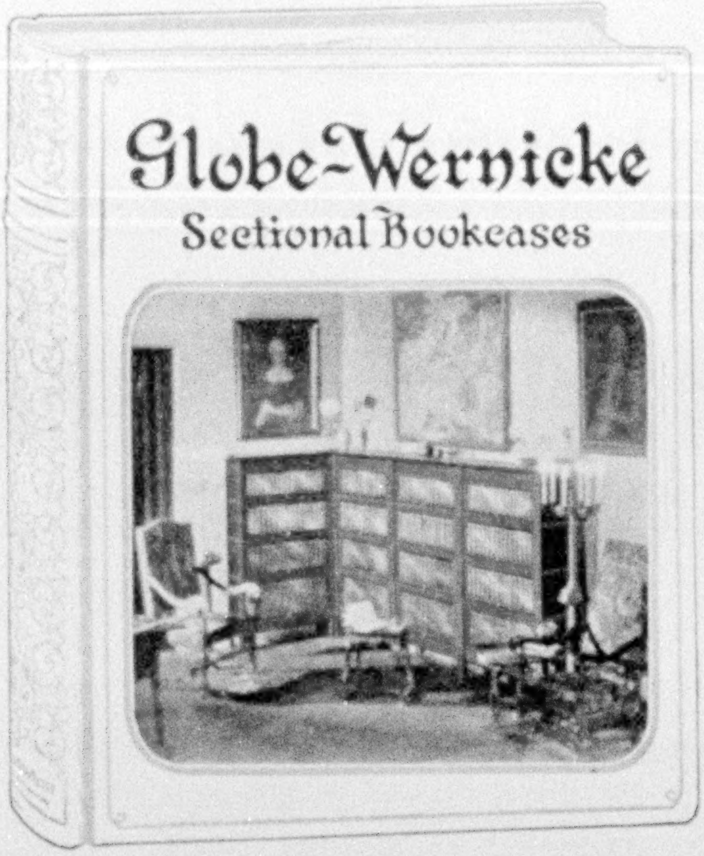

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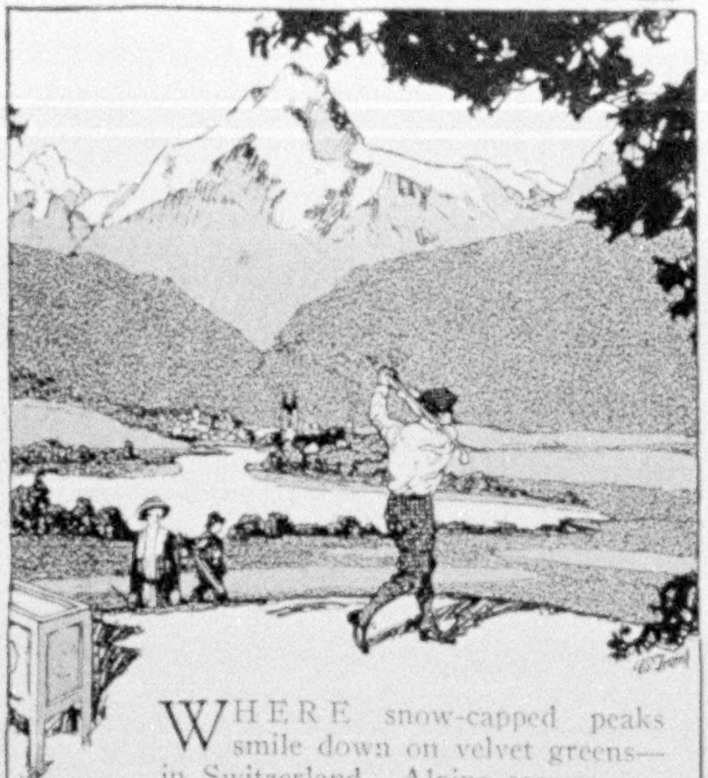

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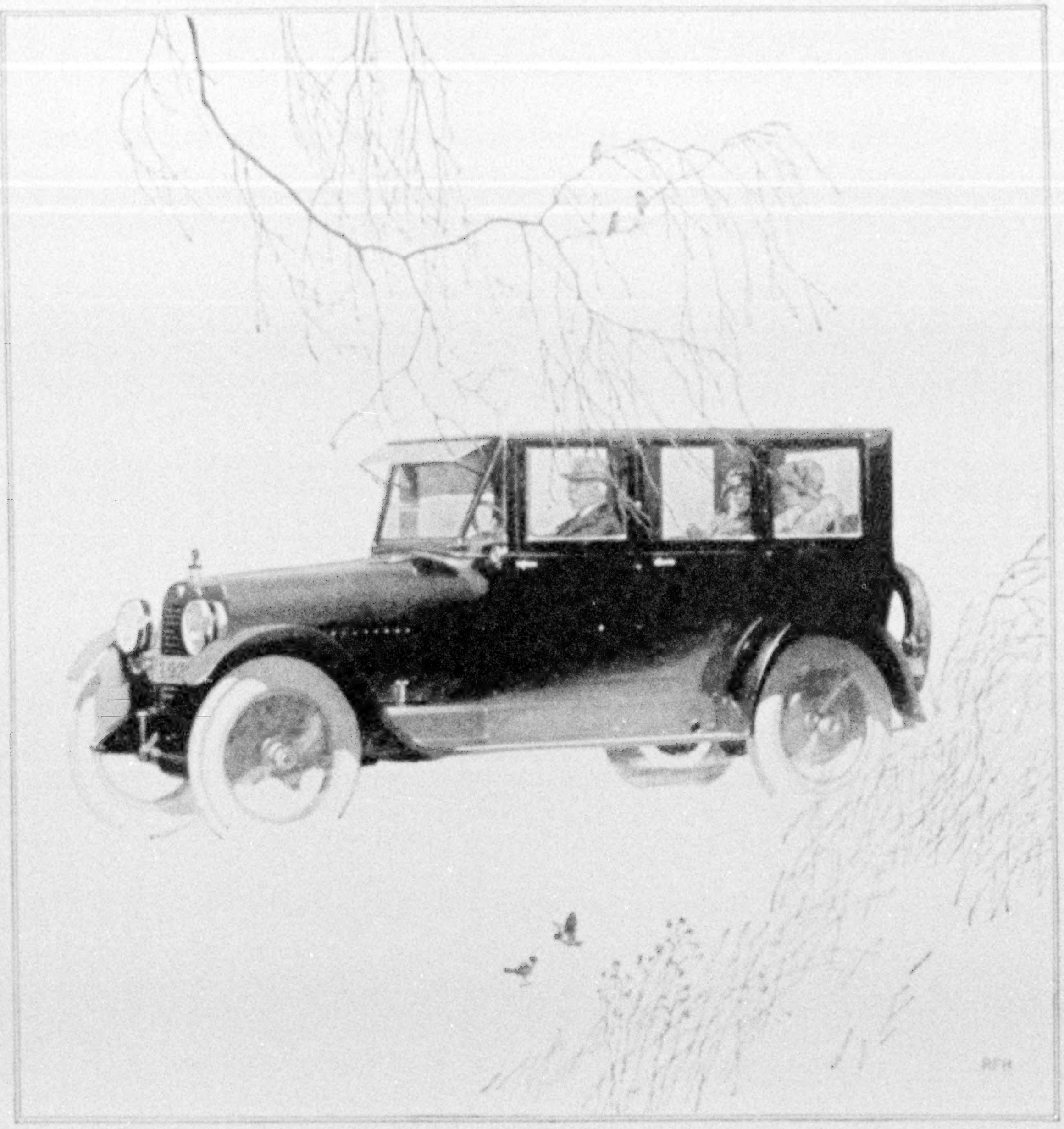

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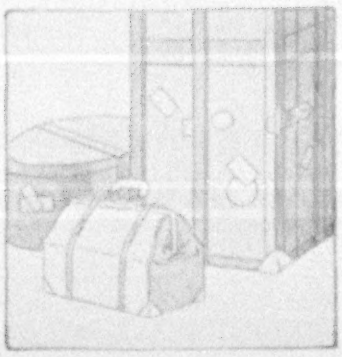

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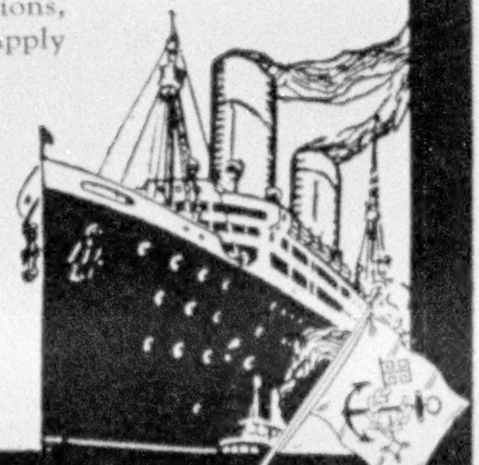
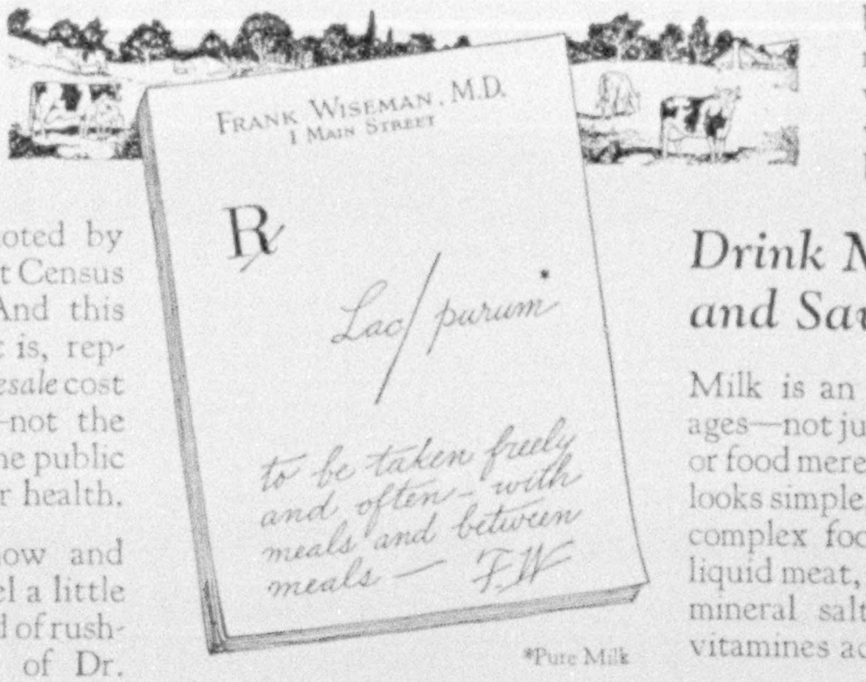


Medicine *vs.* Milk

MORE than $219,000,000 a year for patent medicines in the United States! This is the astounding figure quoted by the latest Government Census of Manufactures. And this figure, startling as it is, represents only the *wholesale* cost of these medicines—not the retail price paid by the public in its frantic search for health.

There are times, now and then, when we all feel a little below par. If, instead of rushing off for a bottle of Dr. Bunkum's Tonique to brace us up, we would go to Nature herself for the greatest of all food-tonics—milk—we would be a different lot of men and women.



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Milk is Nature's Patent

—the only food she ever made solely for food. It cannot be reproduced artificially. Only Nature herself can so perfectly blend all the elements of a well-balanced diet as she has in milk.

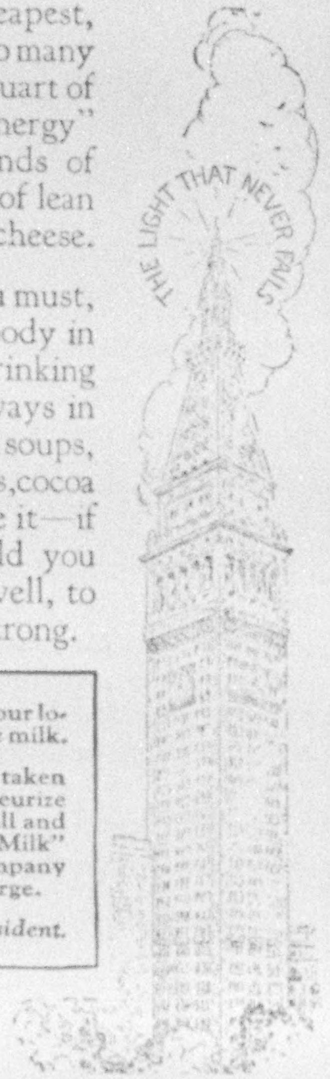
Milk sounds like patent medicine when all its virtues are catalogued. It is the oldest prescription in the world—Nature's prescription for the building of strong, healthy bodies, Nature's revitalizer, Nature's maker of rich, red blood, Nature's nerve quieter, Nature's antidote for that "tired feeling". If milk were announced for what it really is, "The greatest body-builder and health restorative in the world", people would flock to buy it.

Drink More Milk and Save Money

Milk is an ideal food for all ages—not just a pleasant drink or food merely for children. It looks simple, but it is the most complex food in the world—liquid meat, sugar and fat with mineral salts and life-giving vitamines added.

Nutrition experts declare milk to be the most nearly perfect food we have as well as one of the cheapest, for it can take the place of so many more expensive foods. A quart of milk contains the same "energy" value as 8 eggs, or 2 pounds of potatoes, or ¾ of a pound of lean beef or ⅓ of a pound of cheese.

Save on other things if you must, but not on milk. If anybody in your family objects to drinking raw milk there are many ways in which it can be served—in soups, custards, ice cream, desserts, cocoa—lots of good things. Use it—if you are run down, to build you up. Use it—if you are well, to keep you healthy and strong.


THE LIGHT THAT NEVER FAILS

The Metropolitan Life Insurance Company hopes to increase the use of milk, the most nearly perfect food. It desires to arouse public consciousness to the dangers of milk that is not produced and marketed under proper conditions—and by so doing bring about more rigid inspection and safeguard the cleanliness of the milk supply of the nation.

Investigate the source of your milk supply. Organize a committee. If they report the milk is not properly inspected, agitate the question in your local newspapers. Make sure that you get *safe* milk.

If your own local authorities have not yet taken up the matter, it is advisable that you Pasteurize your own milk at home. You will find full and simple directions in a booklet "All About Milk" which the Metropolitan Life Insurance Company will be glad to send you by mail, free of charge.

HALEY FISKE, *President.*

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McCORMACK
Victor Artist

John McCormack's faith in the Victrola and Victor Records as the one medium to reproduce his voice is such that he has made no less than one hundred and sixty-six records, all of which are McCormack's "other self." Among these numbers are:

	Double-faced	
Dear Love, Remember Me I Hear You Calling Me	754	$1.50
Dear Old Pal of Mine Little Mother of Mine	755	1.50
Ah! Moon of My Delight Drink to Me Only with Thine Eyes	6197	2.00

Victrola No. 260
$150
Mahogany or walnut

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GLUCK
Victor Artist

That Alma Gluck has made as many as ninety-eight Victor Records speaks volumes. She herself has said she is proud to be a part of the great work the Victor is doing. Hear these records and you'll know why:

	Double-faced	
My Old Kentucky Home Aloha Oe	6143	$2.00
Home, Sweet Home Listen to the Mocking Bird	6142	2.00
Darling Nelly Gray Nelly Was a Lady	653	1.50

Victrola No. 210
$110
Mahogany, oak
or walnut

RACHMANINOFF
Victor Artist

Rachmaninoff knows music; knows how to compose it, how to play it—and how it should be reproduced. It is significant that in the light of previous experience he chose the Victor to reproduce his art. His twenty-one Victor Records include:

	Double-faced	
Prelude in G Major (Rachmaninoff) Prelude in G Minor (Rachmaninoff)	6261	$2.00
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In buying a talking machine, consider that you must choose the Victrola or something you hope will do as well, and remember that the Victrola—the standard by which all are judged—costs no more. The Victrola instrument line includes twenty-one models of the three general types shown at from $25 up. Ask your dealer or write to us for illustrated catalog.

To be sure of Victor Products, see the following trade-marks—under the lid of every instrument and on the label of every record.

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Look under the lid and on the labels for these Victor trade-marks
Victor Talking Machine Company, Camden, N. J.

VOL. XLV, No. 4 WASHINGTON APRIL, 1924

THE NATIONAL GEOGRAPHIC MAGAZINE

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THE STORY AND THE LEGENDS OF THE PONTINE MARSHES*

After Many Centuries of Fruitless Effort, Italy Is to Inaugurate a Gigantic Enterprise to Drain the Fertile Region Southeast of Rome

BY DON GELASIO CAETANI

Italian Ambassador to the United States

I AM not an expert in geography and I am not an explorer, though he who has lived for any length of time in Italy and takes interest in the beauty of my country truly could be called an explorer who never comes to the end of his task.

I will attempt to tell you something of a generally little-known region, quite close to Rome, called the Pontine Marshes. This strange corner of Italy has been the abode of my family for almost a thousand years and a large part of the land has belonged to us uninterruptedly since the year 1297.

Some of you may inquire where the Pontine Marshes are, but all of you certainly know something about the road that leads to them—the Appian Road, famous for the endless rows of old Roman funeral monuments that line it on both sides.

The Via Appia, built by Appius Claudius about 300 years B. C., starts from Porta San Sebastiano, the southern gate of Rome, and leads toward Naples. For the first 65 miles it runs as straight as a taut string, until it reaches the town of Terracina, where it passes under the cliff of Monte Sant' Angelo that overhangs the sea (see pages 358 and 360).

The Romans had to chisel off part of the rock to make space for the roadbed. After passing this point it makes a first bend and then goes to Naples.

When you leave the Eternal City on this classic road, you pass at first along a wonderful array of old Roman sepulchral monuments; then you climb up the Alban Hills, extinct volcanoes of prehistoric times, and from there you gradually descend upon a great plain, some 30 miles from Rome, known to history as the Pontine Marshes.

MOUNT CIRCEO, WHERE ODYSSEUS AND CIRCE MET

On the left, as you travel toward Terracina, are the olive-covered Lepine Mountains, of gray limestone, that at sunset are veiled by that beautiful purple haze one sees so often reproduced on the background of the early Renaissance paintings. To the right is the Tyrrhenian Sea, along the border of which runs a

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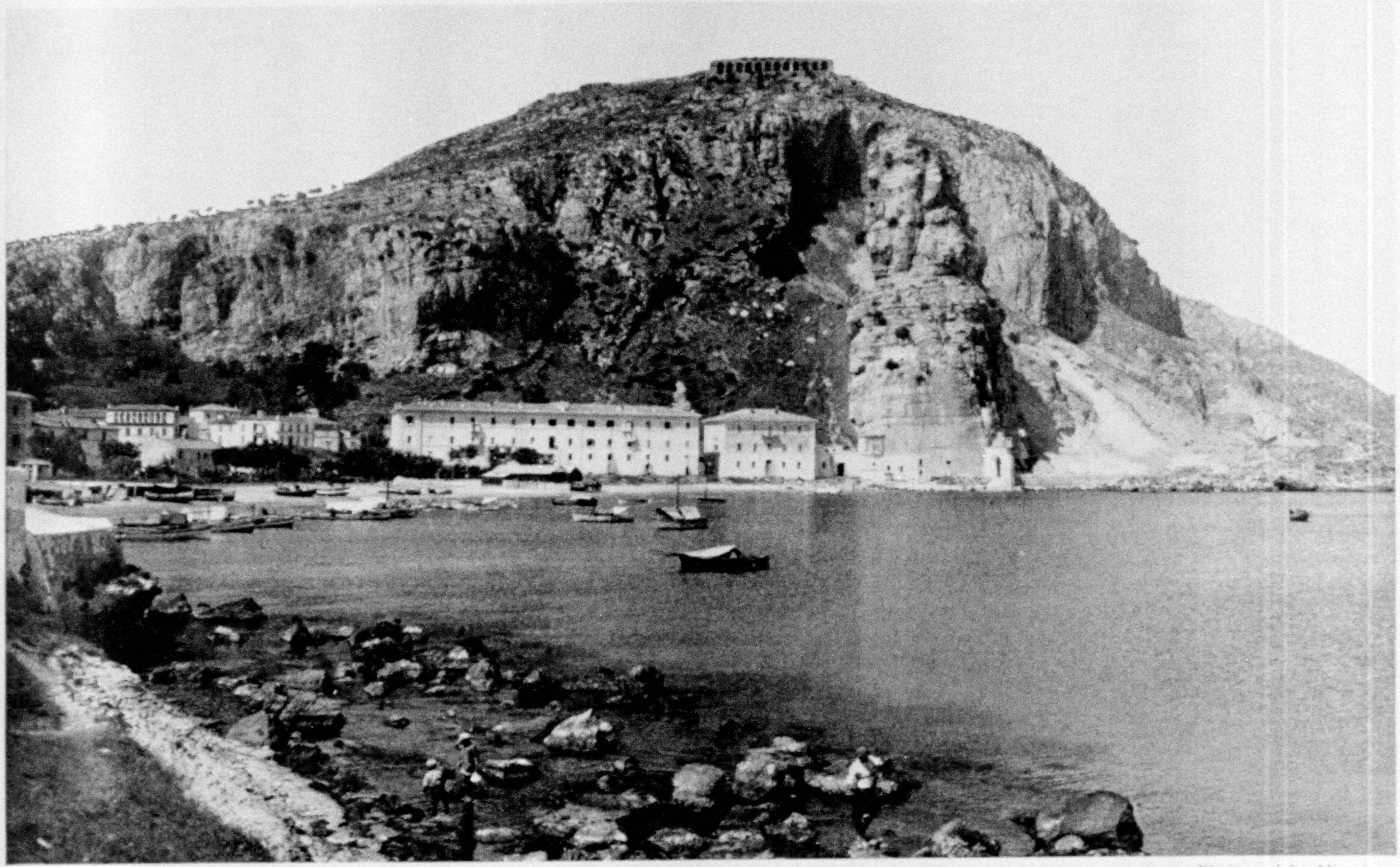
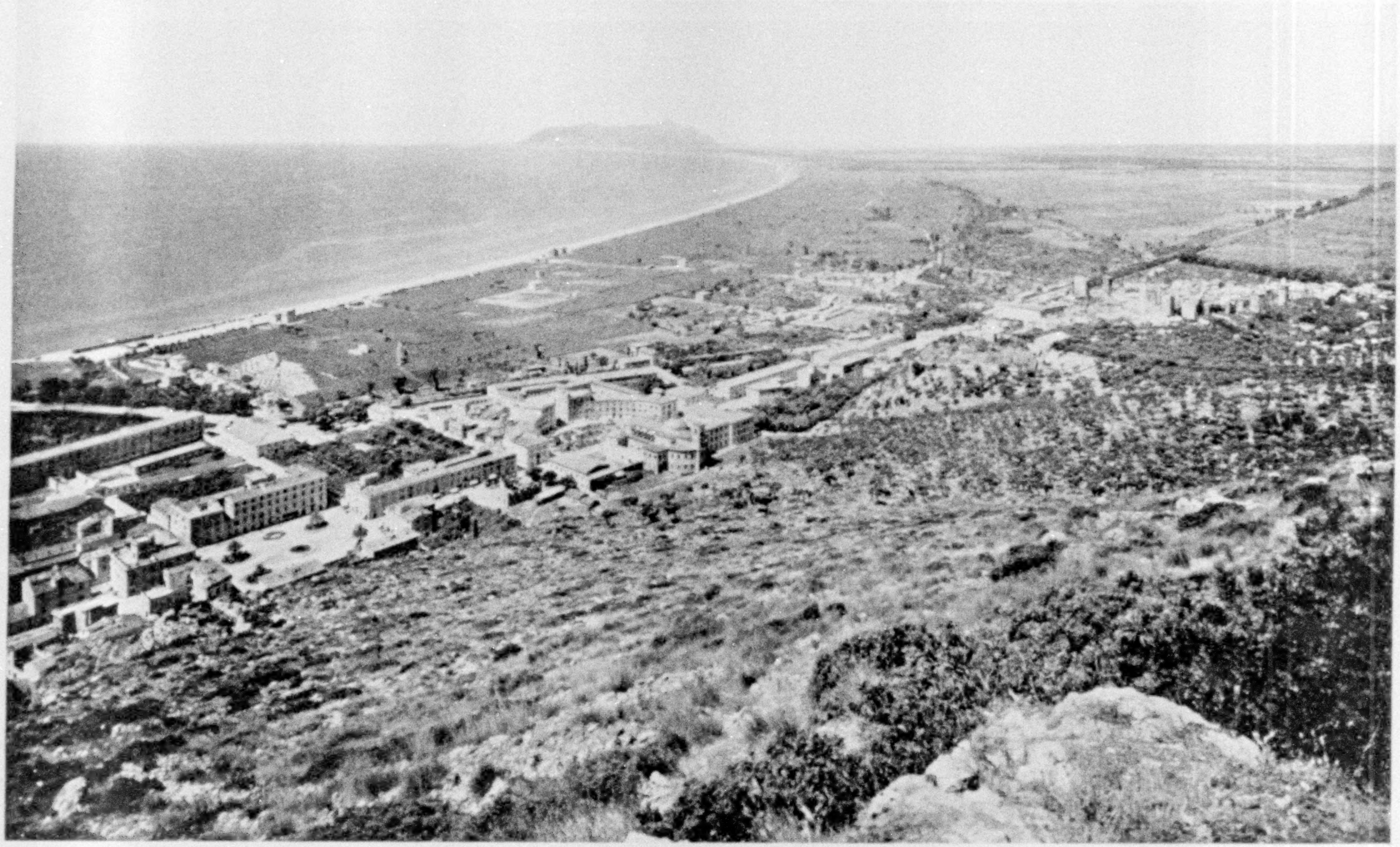
*A lecture delivered before the National Geographic Society in Washington, D. C., January 25, 1924. The manuscript has been revised by Prince Caetani for publication in the NATIONAL GEOGRAPHIC MAGAZINE.



Photograph by Alinari

TERRACINA FROM THE SEA, AT THE BASE OF MONTE SANT' ANGELO

This promontory, rising to a height of 750 feet, is crowned by the remains of an imposing temple dedicated to Venus. Amber and leaden playthings, which Roman maidens used to dedicate to Venus before their marriage, have been unearthed here and are now to be found in the Thermal Museum at Rome.



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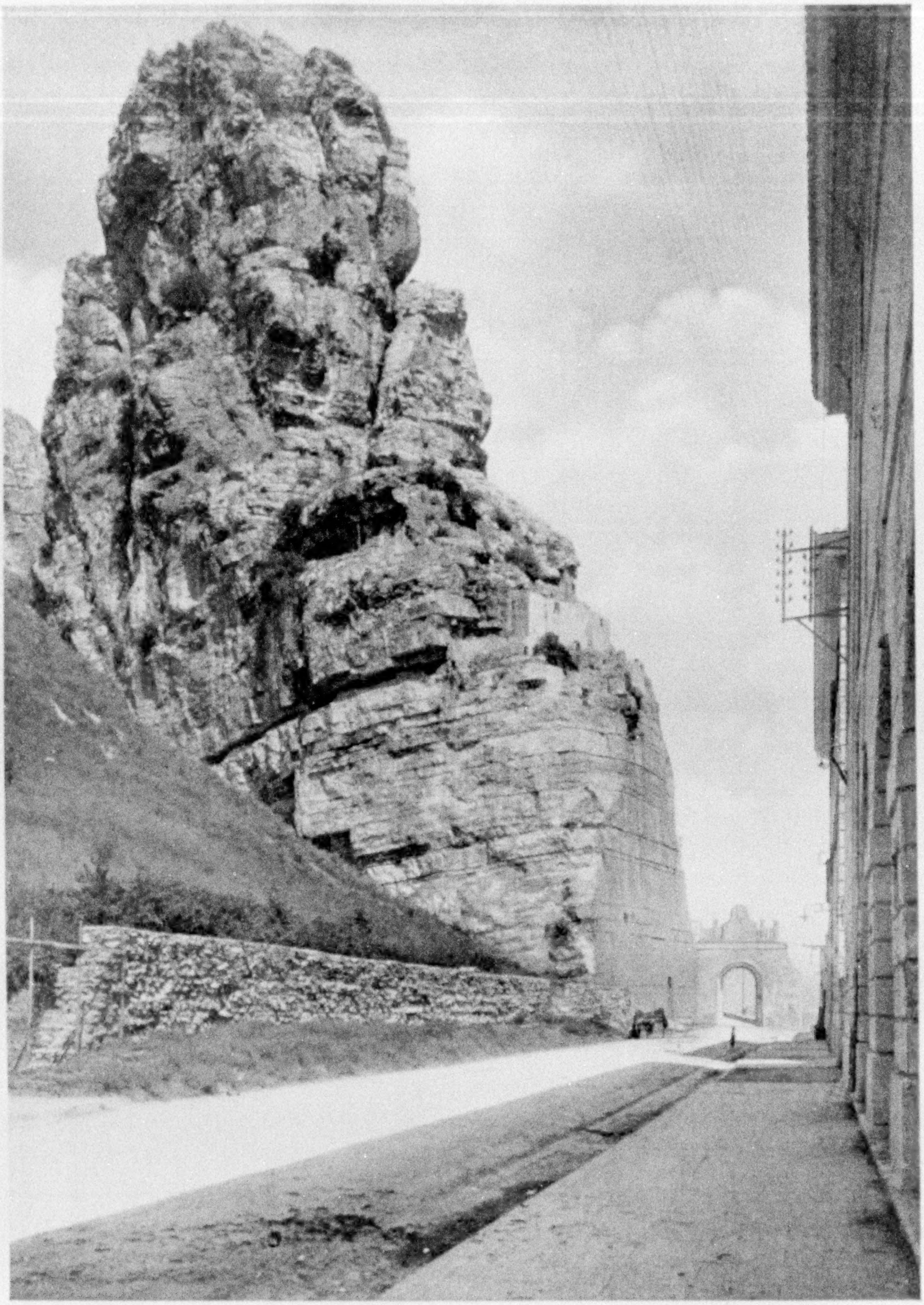
TERRACINA, WITH MOUNT CIRCEO RISING IN THE BACKGROUND AND THE PONTINE MARSHES STRETCHING TO THE RIGHT

The Appian Way may be traced running through the town diagonally from near the upper right corner of the picture.



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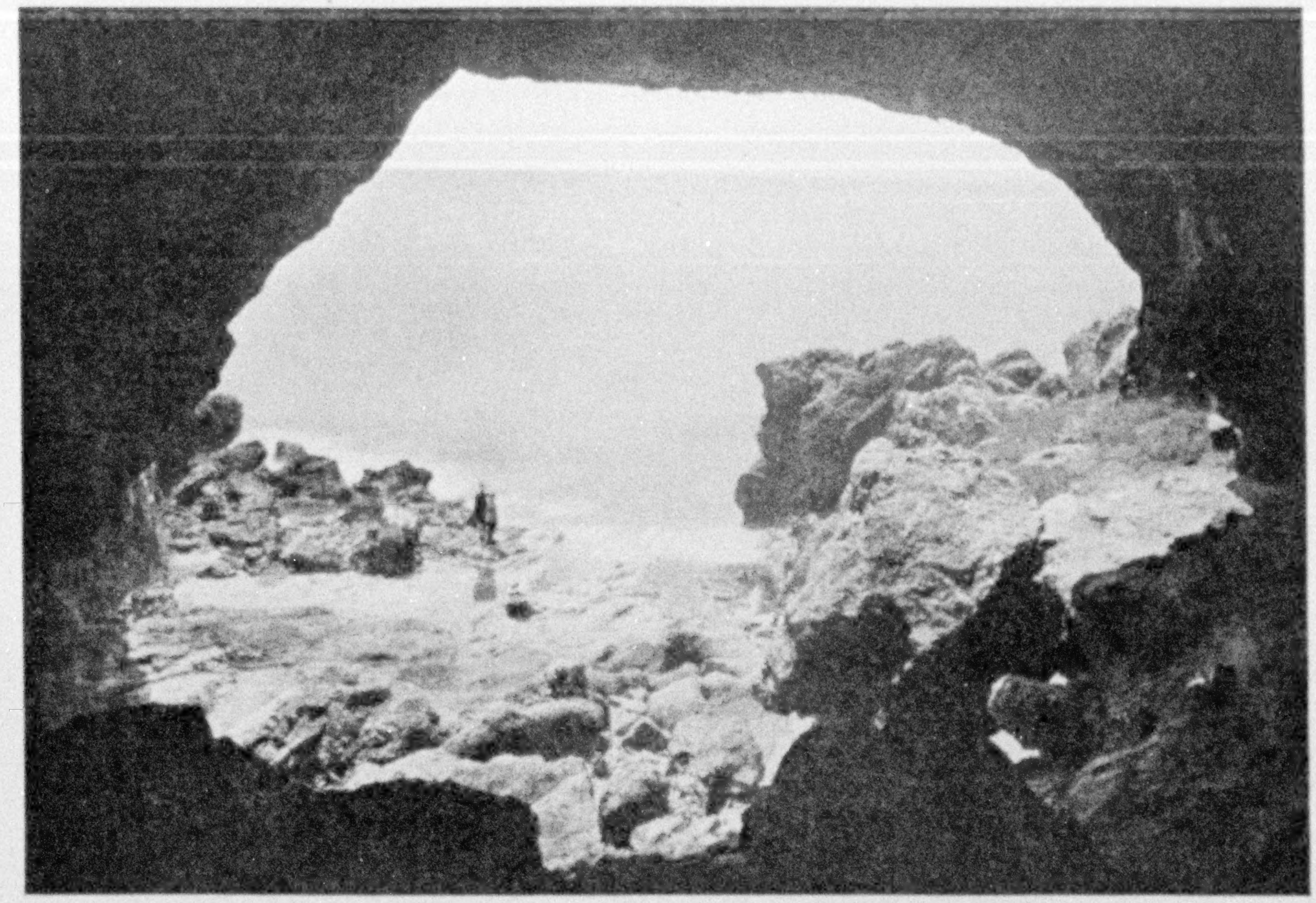
WHERE THE APPIAN WAY TURNS TOWARD NAPLES

"For 65 miles after leaving the southern gate of Rome, the Appian Way runs as straight as a taut string, until it reaches Terracina, where it passes under the cliff of Monte Sant' Angelo" (see page 357). The Gate of Napoleon is seen in the distance.



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THE GROTTO OF CIRCE AT THE FOOT OF MOUNT CIRCEO (SEE PAGE 359)

It is here that legend says Odysseus went to the rescue of his companions, who had been treacherously transformed into pigs by the half-goddess Circe (see text below).

large sand dune covered by a wonderful oak forest some 30 miles in length. Between the dune and the sea is a series of lagoons.

At the extreme end a solitary mountain rises, to all appearances from the sea. It is Mount Circeo, the cornerstone of the Pontine Marshes. This mount was an island in bygone ages, as geologists have proved, and Homer, eight centuries before Christ, speaks of it in the "Odyssey" as an island, though probably it was not so any longer (see page 359).

Circeo was the scene of the legendary encounter between Odysseus and Circe, the sorceress.

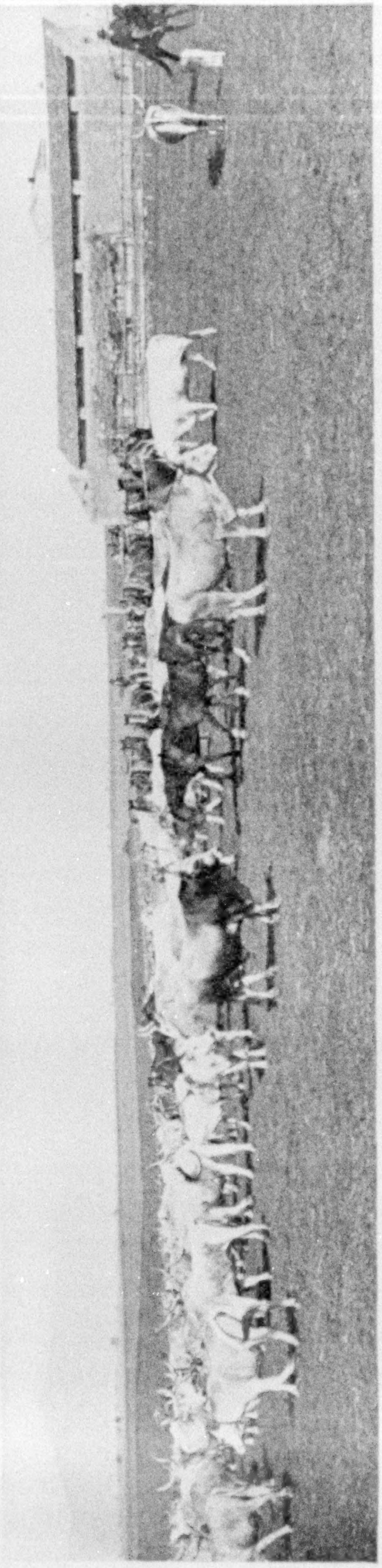
After long and wearisome travels, the hero of the Siege of Troy lands with his companions on this rocky island, full of mysterious grottoes and caverns. Several of his men, while on a reconnoitering mission, are received in the wonderful palace of the half-goddess Circe, who treacherously gives them a drugged beverage which instantly transforms them into pigs. Odysseus goes to their rescue. With the help of Hermes he remains unharmed by the magic of Circe, and at the point of his sword obliges her to free his companions.

On the north side of the mountain the people still show a large grotto which is said to have been the haunt of the tricky goddess (see illustration above).

The large quadrangle formed by the foothills of the Alban volcanoes, by the Lepine Mountains, by the wooded sand dunes of the coast, and by Mount Circeo, measuring some 150,000 acres of extraordinarily fertile land, is known to history as the Pontine Marshes (see map, page 394). The water, hemmed in on all sides, cannot flow out.

In winter the mountain streams pour their foaming, muddy torrents upon this lowland, flooding thousands of acres; the rich mud slowly settles, coating the fields with a silt which is the finest of fertilizers; then the waters gradually flow out through narrow channels until, in summer, only the lowest portion of the land, that which lies practically at sea-level, remains in a swampy condition.

A dense, luxuriant growth of water



LONG-HORNED CATTLE OF THE ROMAN CAMPAGNA FIND IDEAL PASTURAGE ON THE PONTINE MARSHES AFTER THE WINTER WATERS HAVE SUBSIDED (SEE TEXT, PAGE 368)

plants springs up with the approach of the warmer season; the stagnant, lukewarm waters teem with life of every description, and toward the month of July the treacherous Anopheles mosquito drops its filmy larval veil, rises out of the marshes, and, flying around in search of a living for itself, sows death upon humanity. By stinging a malaria-infected person the mosquito infects itself, and then, stinging some healthy individual, it communicates to him the disease.

Malaria is not deadly in itself, but its repeated attacks so weaken the human organism that frequently fatal illnesses take hold of the fever-stricken body.

MALARIA HAS DRIVEN THE PEOPLE FROM THE PLAINS

The inundations in winter and the malaria in summer have driven the population out of the plain; but the unparalleled fertility of the soil entices some people back to defy the disease. The lowlands of the Agro Pontino are deserted; there are no cities or villages, but some lonely hamlets and, scattered here and there, farm buildings, in which only a few persons live in summer.

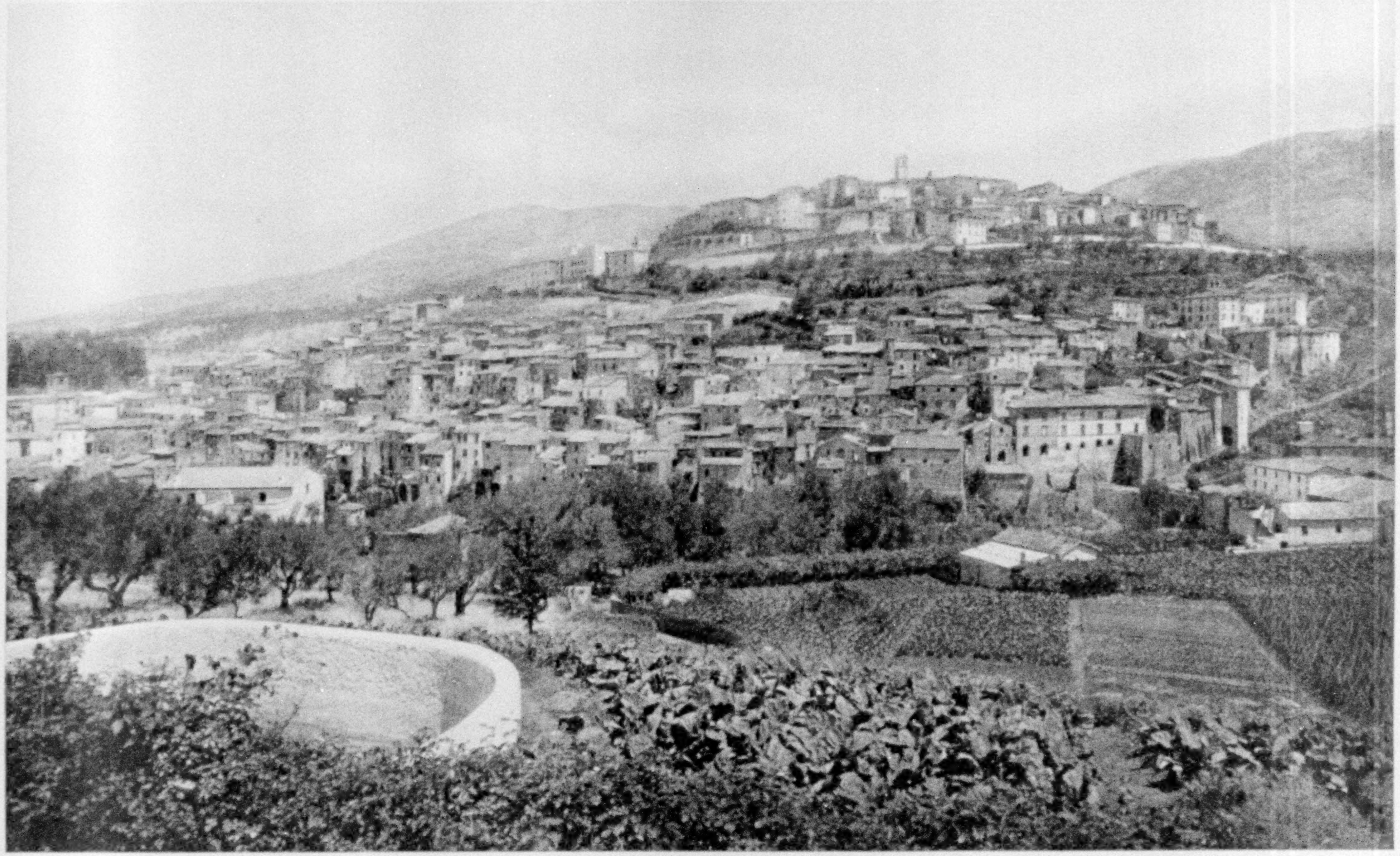
Many centuries ago most of the inhabitants fled to the mountains, built their towns on some steep hills, and from these vantage points made dashes into the plain to work the fields and tend the cattle.

Such a place was ancient Cori, founded by the Trojan Dardanos, with its city walls constructed of huge polygonal blocks and with its beautifully preserved Temple of Hercules (see pages 363 and 364).

A little farther on rose Norma, on the very edge of a vertical cliff 600 feet high, as ancient, if not more so, than the city of Rome. In olden times it was called Norba, and the cyclopean walls, formed out of huge, carefully trimmed boulders, are still a marvel to those who visit this not easily accessible place.

At the foot of Norma is the abandoned medieval town of Ninfa, the Pompeii of the Middle Ages, as Gregorovius called it, covered with ivy and brambles. This is one of the most poetic spots of the world (see page 373).

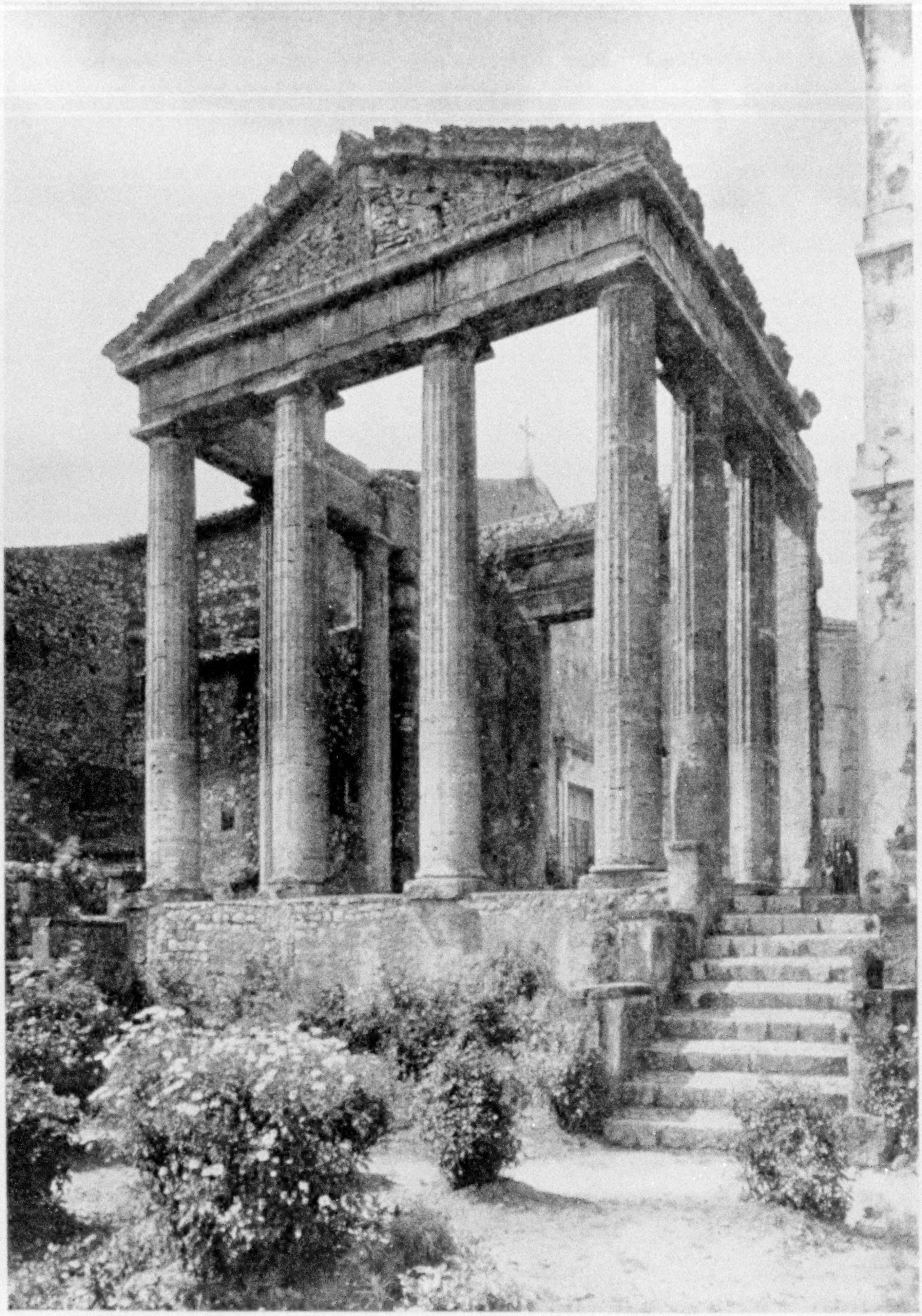
A little farther along the range is Sermoneta, with the thirteenth century castle



Photograph by Alinari

THE ANCIENT CITY OF CORI, ON THE EDGE OF THE PONTINE MARSHES

Founded, according to legend, by the Trojan Dardanos, this city (known in ancient times as Cora) still preserves remnants of its great walls, composed of huge polygonal blocks. It was almost wholly deserted early in the Middle Ages, but was rebuilt in the thirteenth century. Among its many interesting ruins is the Temple of Hercules (see illustration, page 364).



Photograph by Alinari

THE TEMPLE OF HERCULES AT CORI (SEE PAGE 363)

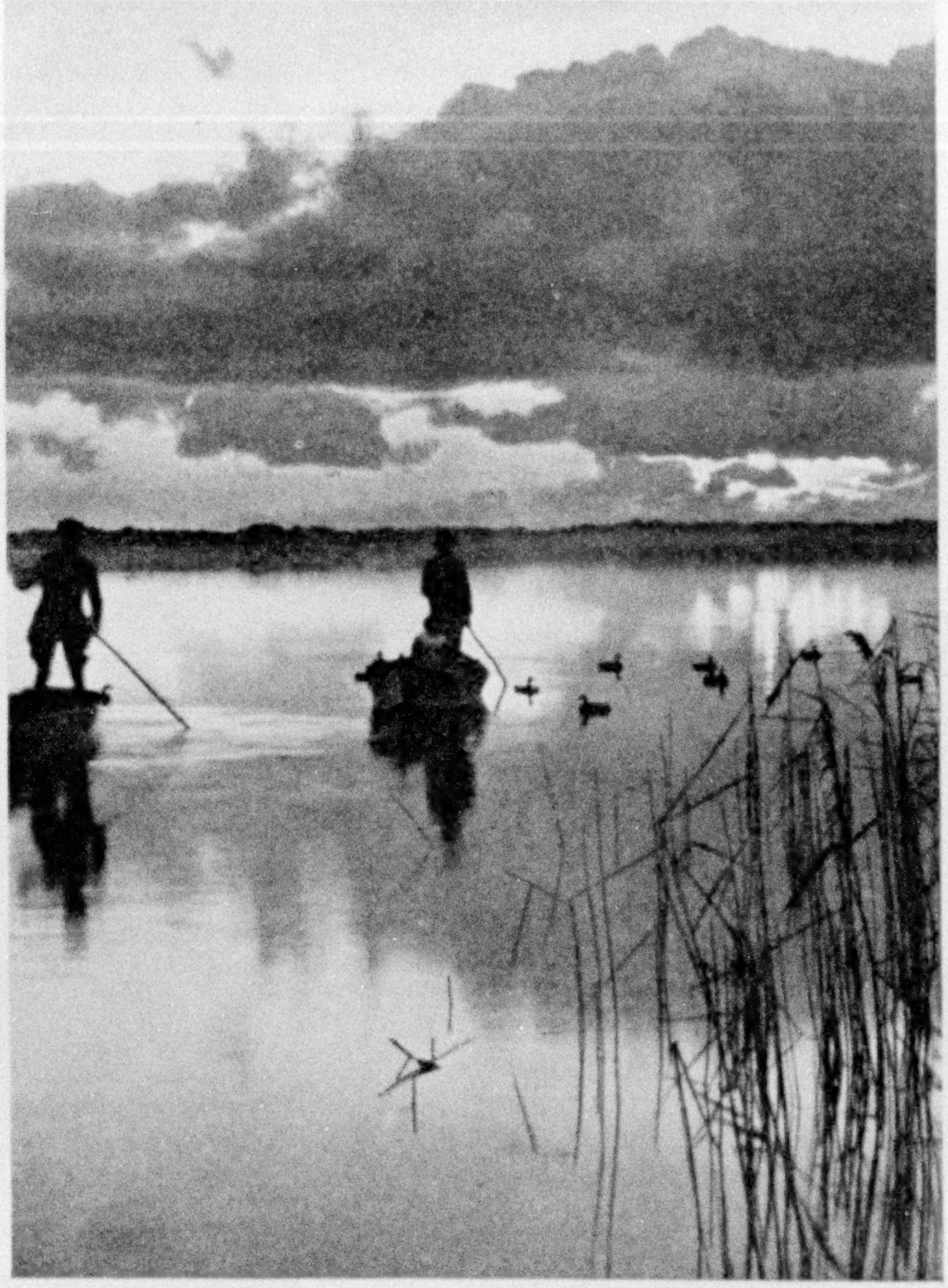
The name of this ruin is probably a misnomer. Inscriptions indicate that it was dedicated to Jupiter, Juno, and Minerva. A statue of Minerva, supposed to have been found here, now adorns the fountain in the Palace of the Senators at Rome.

of the Caetani towering on a high mountain spur and dominating the vast plain of the Pontine Marshes (see page 372). Then follow Sezze, Piperno, and other towns.

TWENTY-THREE TOWNS HAVE DISAPPEARED

These are the inhabited places today; but in olden times the whole land was densely populated and highly productive. Twenty-three towns are supposed to have existed where now one sees not the trace of a single building. The most famous of these cities which have disappeared was Pometia, conquered and sacked by the Roman King Tarquinius the Superb in the sixth century before Christ.

It is astonishing that not a trace is left of these towns — not a single crumbling wall or the foundation of a building. We do not even know exactly where Pometia was located. Of Tiberia, a town that grew up around one of the villas of Tiberius and flourished in the early Middle Ages, only a single piece of concrete foundation is left.



DUCK HUNTERS ON THE LAGOON OF FOGLIANO

Here the waterfowl come from the sea, seeking shelter and food (see text, page 367).

San Donato, a prosperous community that rose on the sand dunes near the sea, has completely disappeared. When in the year 1298 Peter Caetani took possession of this property he went from one building to the other, ostentatiously opening and closing the doors and touching the walls with his hands, as the ceremonial of those days required.

Now, as you go through the oak forests of San Donato, winding your way between the malaria-breeding ponds and the thorny brushwood, you do not see a single stone protruding above the ground. My mother made excavations on the spot and was fortunate enough to find the tomb of Camenius, the last pagan owner of this property, who died toward the middle of the fourth century of our era. The widow had had an inscription engraved on the large tombstone; in a few beautiful verses she recalls his high offices and expresses her sorrow at being left alone to bear the burdens of life.

Now, where the villa of Camenius rose the fishermen dry their nets. The lagoons are wonderful fishing grounds that have supplied Rome for two thousand years (see page 366).

As I said before, these lagoons have

FISHING BOAT HARBOR ON THE PONTINE LAGOON

"The lagoons are wonderful fishing grounds, that have supplied Rome for two thousand years."

THE PONTINE MARSHES AT HIGH WATER

In winter large tracts of land are submerged; in spring the waters subside and the fields are covered with grass and flowers (see text, page 368).

WASHING DAY: WOMEN OF THE PONTINE MARSHES DISTRICT UTILIZING THE LINEA CANAL, BUILT BY POPE PIUS VI

formed between the great prehistoric dune covered with oak forest and the more recent one thrown up by the sea.

There is no natural communication between the lagoons and the sea. When these lakes swell, during the rainy season, the fishermen cut a small ditch across the dune, and the waters, rushing out to the sea, in a few hours widen to a broad river. The fish taste this lukewarm, brackish water and swim by the thousands and millions into the lagoon, where they are caught.

This locality is also a wonderful shooting resort, where our friends go at dawn to hide behind the blinds on the water's edge. There the ducks come from the sea, seeking shelter and food in that maze of ponds and canals distributed throughout the dense growth of reeds (see illustration, page 365).

The complete disappearance of the old cities of the Pontine Marshes is not difficult to explain. The whole zone is alluvial ground, formed of clay, sand, and thin gravel; you cannot find a single stone in a ten-mile circle. Therefore every abandoned building, every piece of ruin, becomes a precious quarry for the construction of new buildings, and the necessities of the later population have completely obliterated the monuments of former civilizations.

THE APPIAN ROAD DISAPPEARED BENEATH WATER

As I said before, at the time of the Roman Republic, in the fourth and fifth centuries B. C., the Pontine region seems to have been free of waters, healthful, and densely populated. Then, a little before 300 B. C., near the time the Appian Road was built, something happened that has not been fully understood.

The natural outlet of the waters in the depression between the city of Terracina and Mount Circeo was obstructed, probably through some seismic movement; a raising of the ground a few feet was quite sufficient to stop the outflow of the waters, and the sea increased the obstruction by piling up sand dunes.

In this way the great plain of Pometia became hemmed in on all sides by higher lands and converted into a large basin, into which the waters naturally converged

WATER BUFFALO IN ONE OF THE CANALS OF THE PONTINE MARSHES

These African beasts are said to have been brought to Italy by the Carthaginians under Hannibal (see text, page 371). While they make acceptable beasts of burden (see opposite page), they perform their greatest service to man during their "hours of leisure," when disporting in the marshes, for it has been found that they are the most effective agency in ridding the irrigation and drainage canals of clogging aquatic plants, which they uproot with their hoofs.

from everywhere, but from which they could not flow except through the narrow channels dug near Terracina to connect the marshes with the sea.

The ground became water-soaked. The great Appian Road, not a long time after being built, began to sink in places and had to be raised by Trajan and other Roman emperors. During the eighth century it went completely under water and the road from Rome to Naples had to be shifted to the foothills, passing near Ninfa and Sermoneta. From that time to the present this waste but fertile region became the playground of unruly waters.

ATTEMPTS TO DRAIN MARSHES HAVE EXTENDED OVER TWENTY-TWO CENTURIES

In winter large tracts of land are submerged under the yellow waters, which often rise as high as the tops of the fences; ducks, sea gulls, and geese make it their home, diving in the shallow water for food.

In spring the waters subside and the fields become covered with a luxuriant growth of grass and flowers, where the sheep and the long-horned cattle of the Roman Campagna find ideal pasturage (see page 362).

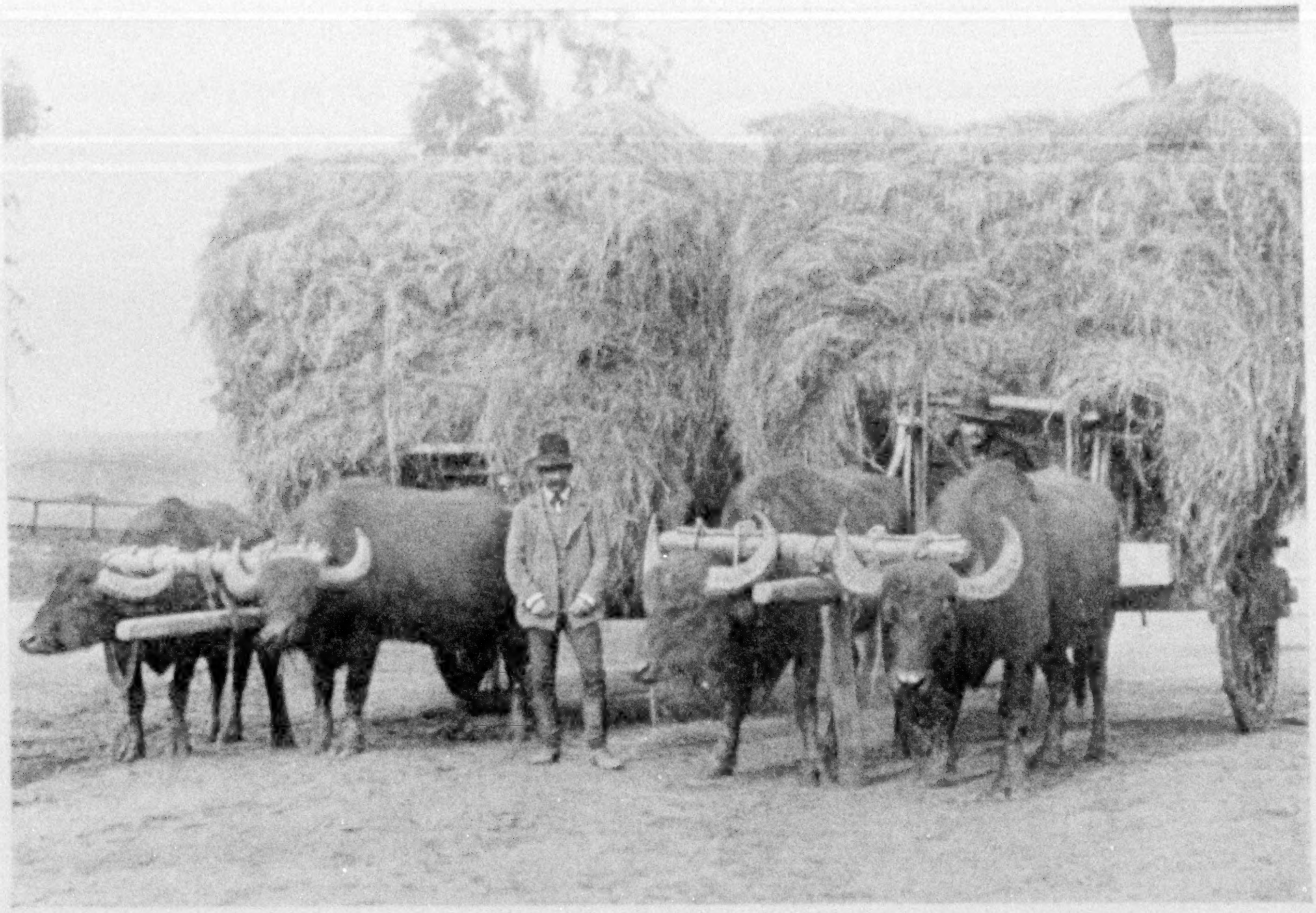
For 2,200 years the rulers and the people of Rome have vainly tried to drain the marshes.

The first serious attempt was made by the Consul Cornelius Cethegus, about 185 B. C.; but the work was discontinued during the civil wars between Marius and Sulla (88 B. C.) and between Cæsar and Pompey (48 B. C.).

Julius Cæsar made vast plans, which were, however, abandoned after his assassination (44 B. C.).

Nerva and Trajan worked at the restoration of the Appian Road that was sinking; then came the decline of the Roman Empire, and we read of no reclamation projects until the end of the fifth century, when Theodoric, King of the Ostrogoths, intrusted the work of draining the marshes to the patrician Decius, who successfully accomplished it.

There is a most remarkable piece of work to be credited to the Romans of these first centuries, but nobody knows exactly to whom. It is the Rio Martino,



WATER BUFFALO DRAWING CARTS OF HAY

As mentioned before, the marshes are separated from the sea by a prehistoric dune some three miles wide and a hundred feet high. The Romans, with great daring and with an enormous expenditure of labor, dug right through this dune at sea-level, and this gigantic cut, with the sides over a hundred feet high, appears to-day, a strange rectilinear valley traversing the oak forest.

A LAWSUIT THAT LASTED 560 YEARS

However, all these works proved ineffectual. The condition of the Pontine land became worse and worse. The waters could not find sufficient outlet and during the rainy season inundated large tracts of land. Each group of inhabitants, therefore, strove principally to divert the waters from their own properties to those of their neighbors.

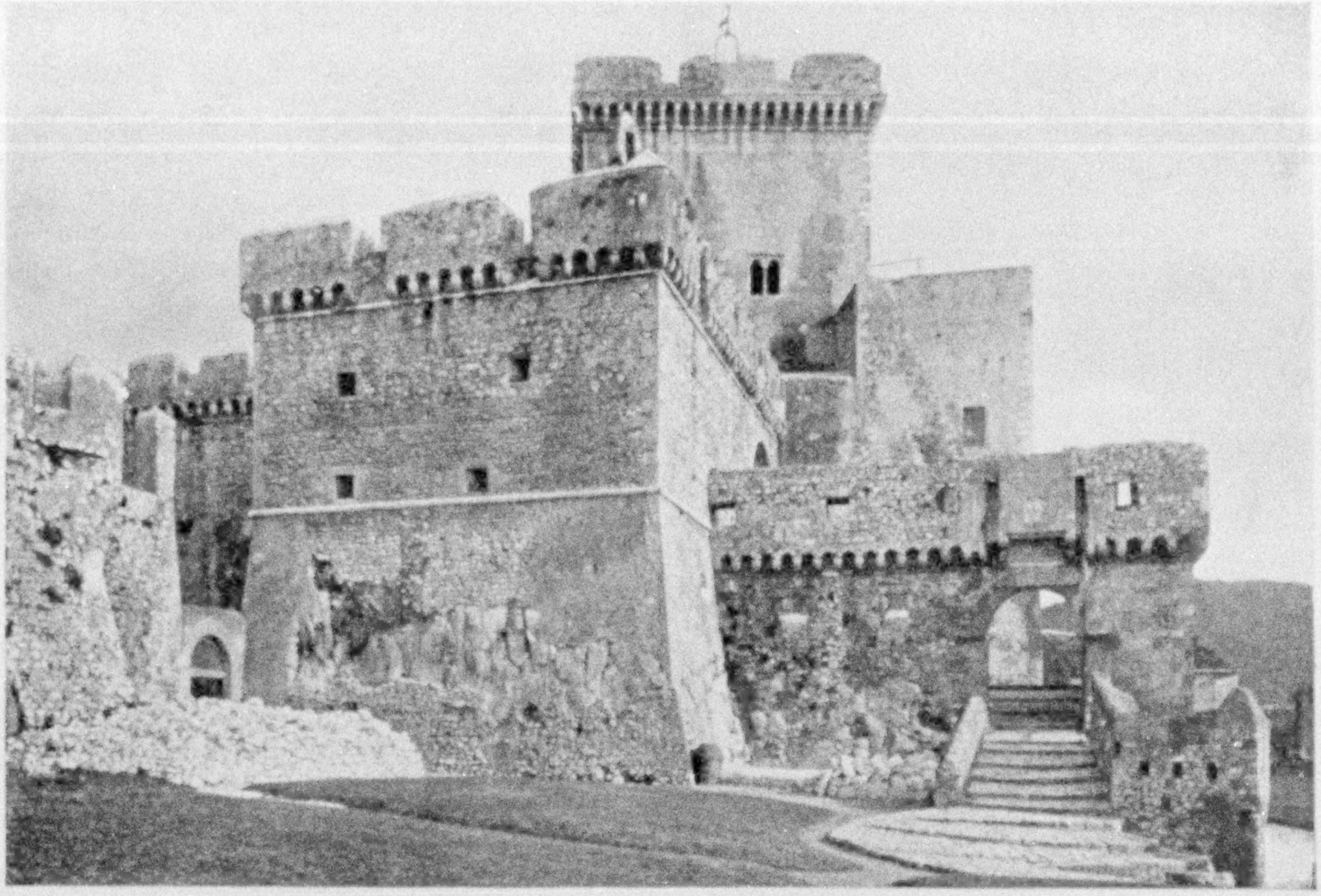
Lawsuits were instituted and wars broke out incessantly in every direction. Our family, as lords of Sermoneta and in the interest of our people, had to quarrel with the neighboring community of Sezze, and from this resulted the longest lawsuit that exists, I believe, in the records of Italy. It started about the year 1230 and ended about 1790, with the draining of the marshes by Pius VI. For about 560 years, therefore, this suit was carried on, with no period of intermission exceeding 20 or 30 years. When the decisions of the courts did not suit the people, they resorted to arms, and many bloody battles were fought.

The stronghold of Sermoneta was the powerful castle of the Caetani. Perched on top of a rocky mountain, strongly fortified with towers, creneled walls, and drawbridges, it could safely defy any enemy (see illustrations, pages 370, 372).

Pope Alexander VI confiscated it from our family, charging that we had unwarrantedly waged war on Sezze, but really for the purpose of giving the large Caetani estates to his son, Cesare Borgia, the Duke of Valentinois, for whom he had its fortifications greatly strengthened.

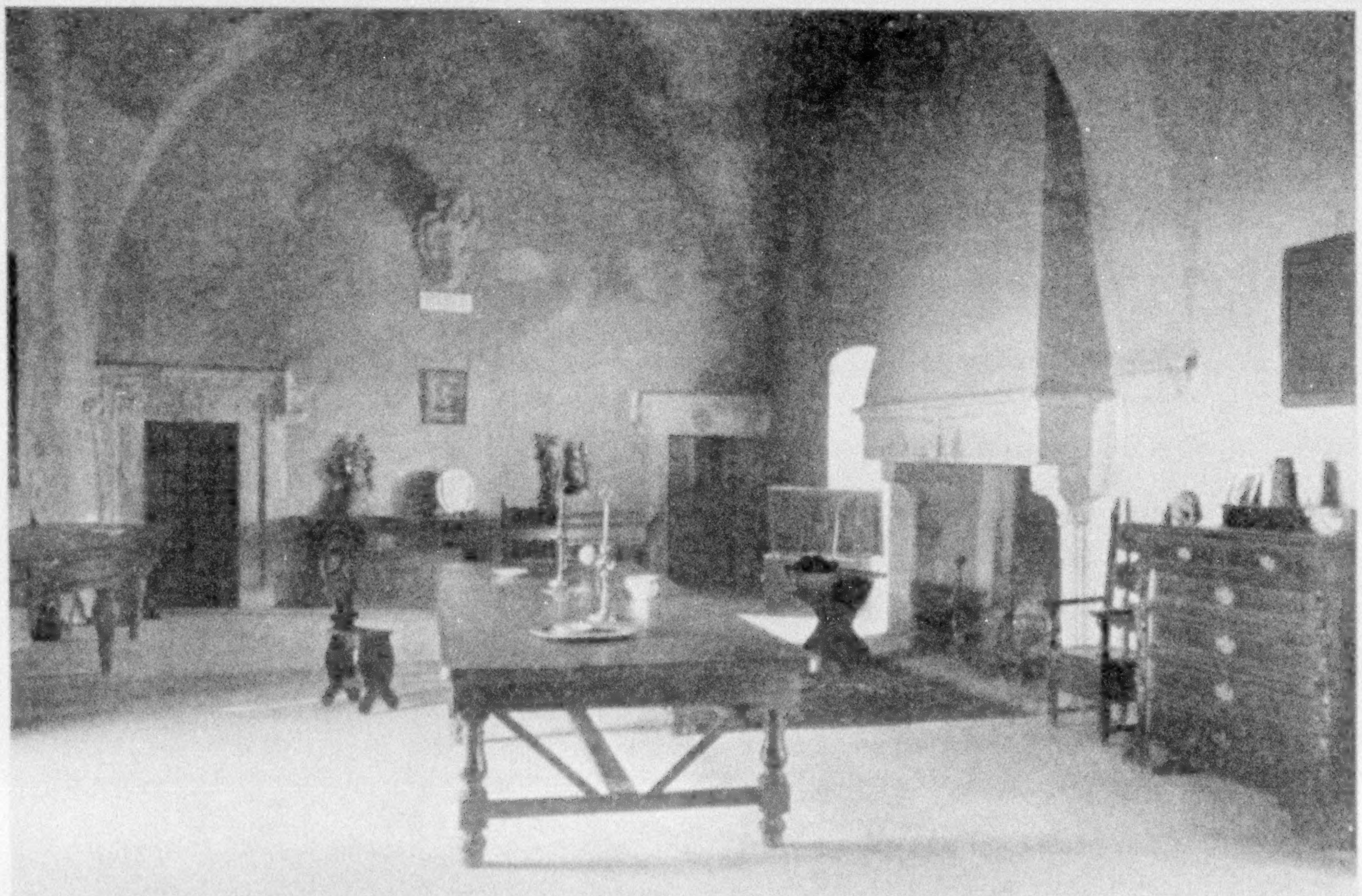
Alexander gave the castle itself to his daughter, the famous Lucrezia Borgia, who became the first duchess of Sermoneta, and the great halls of the castle have surely seen passing under their vaulted ceilings this beautiful woman, on whom popular belief has piled infamous accusations that historians have never been able to prove (see illustration, page 370).

When Alexander had completed the



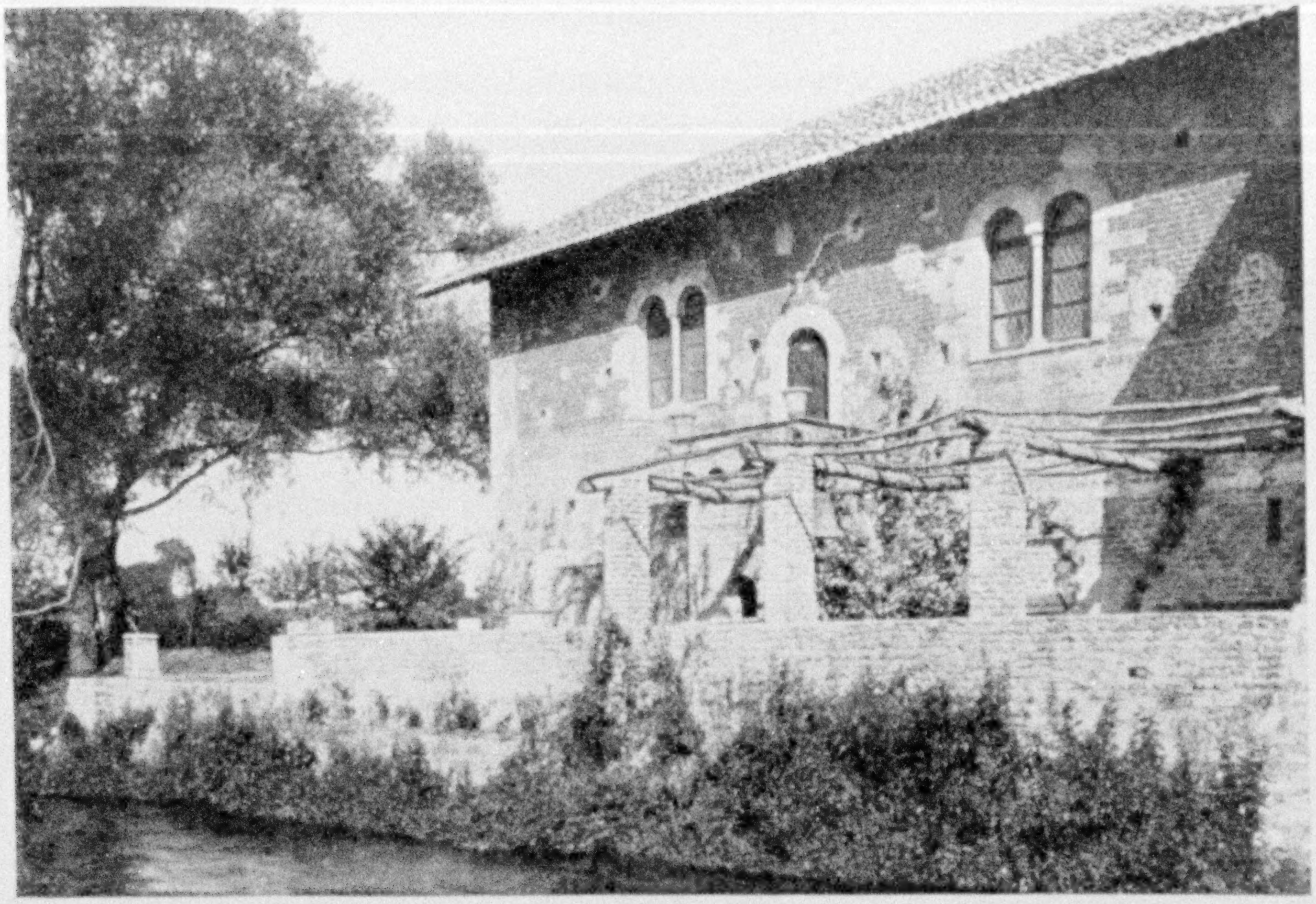
ENTRANCE TOWER OF THE CASTLE OF SERMONETA, ANCESTRAL HOME OF THE CAETANI FAMILY

The quarrels in medieval times between the lords of Sermoneta and the neighboring community of Sezze resulted in the longest lawsuit of Italian history—from 1230 to 1790 (see page 369).



INTERIOR OF THE CASTLE OF SERMONETA

These walls have echoed to the footfalls of the famous Lucrezia Borgia, to whom Pope Alexander gave the castle, creating her the first duchess of Sermoneta.



THE OLD MUNICIPAL HALL OF NINFA, NOW THE AUTHOR'S PRIVATE HOUSE (SEE ILLUSTRATION, PAGE 373, AND TEXT, PAGE 374)

improvements and the fortifications of the castle, the Duke of Valentinois, according to Sanudo, took it away from his sister, saying, "She is a woman and can't hold it."

MANY POPES HAVE TRIED TO REDEEM THE LAND

It is impossible to enumerate all the attempts made by the Popes to drain the marshes. The space allotted to me is not sufficient.

Our family Pope, the great Boniface VIII, made some fruitless attempts in the year 1301; so did Martin V, of the Colonna family, about the year 1420. Then came Eugene IV and Leo X; the latter gave large grants for this purpose to his nephew, Giuliano dei Medici, in 1514, who made a serious attempt to carry through the work.

Urban VIII, about the time the *Mayflower* landed on the New England shores, intrusted the work to a Dutchman, Cornelius Wit. Our family made a similar attempt about that time and brought 200 families from Holland to Ninfa. They only stayed a few years, and those who survived the malaria fled and never showed up again. An attempt at colonization with Albanians was no more successful.

At last, in 1777, Pope Pius VI accomplished the most successful work on record.

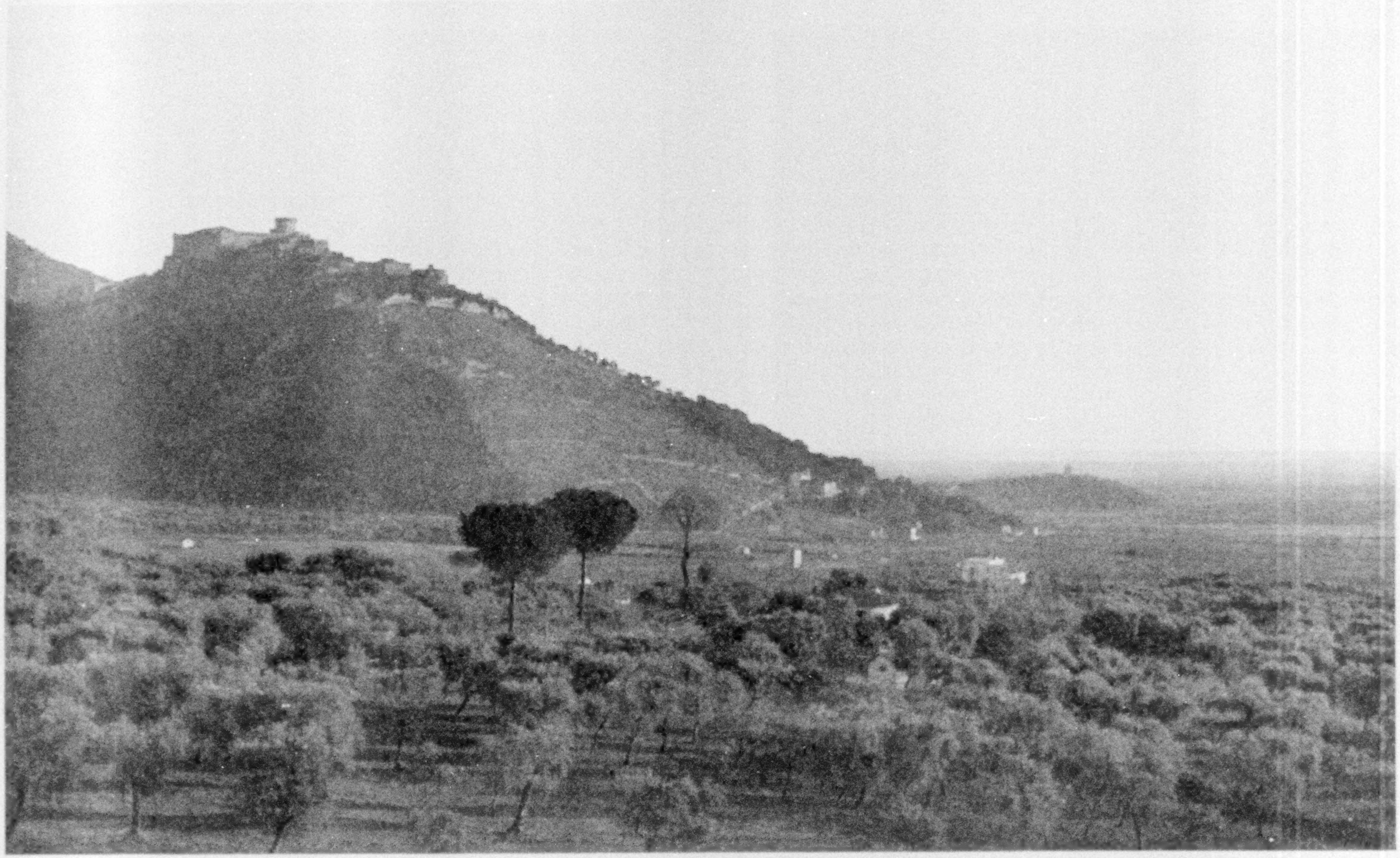
He dug a large canal along the Appian Road and regulated the flow of waters by a network of canals. A large part of the land was drained and the Appian Road of the centuries emerged again from the waters.

But even this great effort only partly improved conditions.

WATER BUFFALO FIGHT FOR MAN

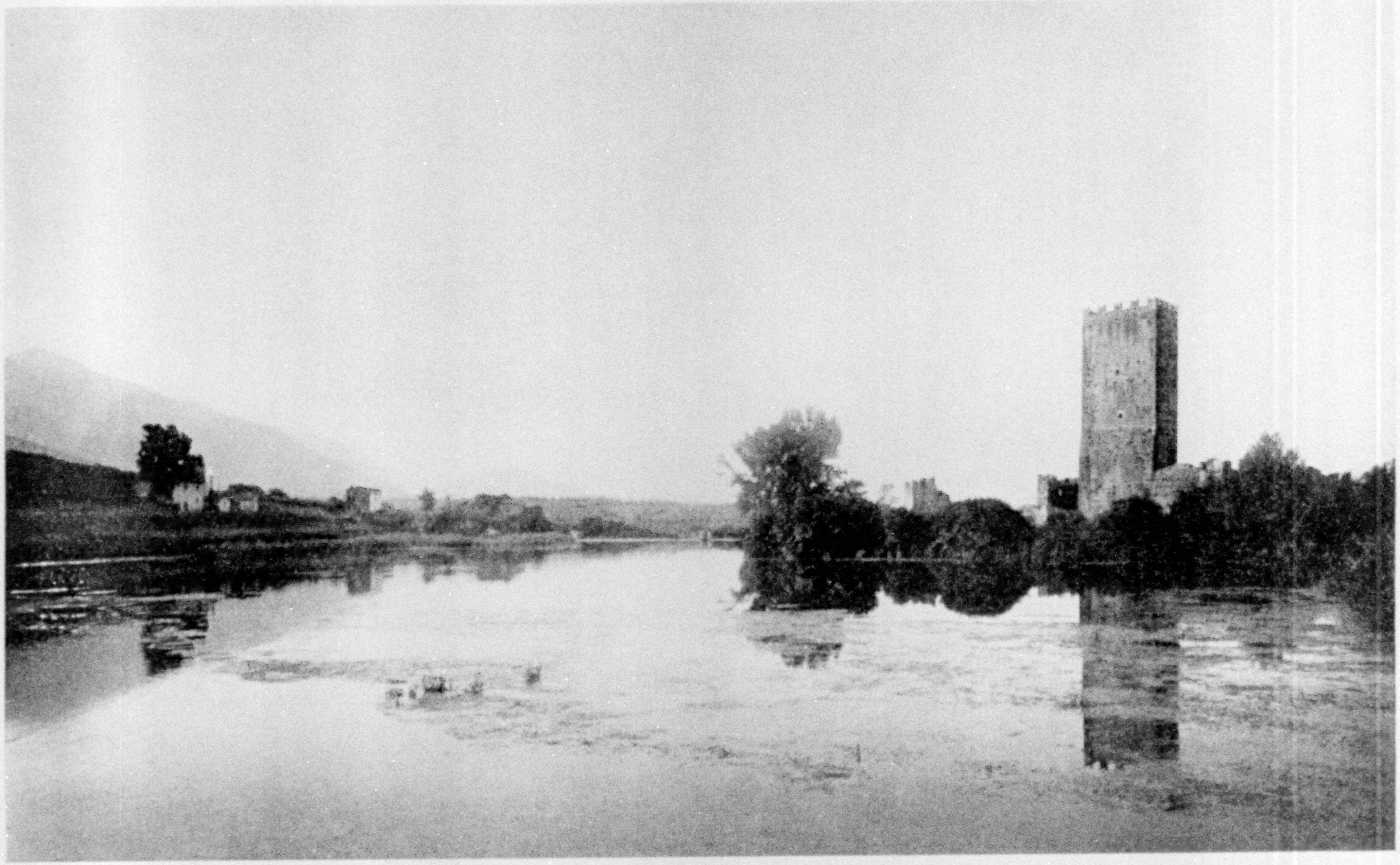
Strange to say, one of the principal difficulties in controlling the waters is caused by the aquatic plants that grow in the canals. In the space of a very few weeks these become so dense that the ditches are completely choked. Thus far no practical way has been found to eradicate these plants.

The most effective means of combating this menace, a very ancient one, too, is to employ buffalo—an African species,



THE CASTLE OF SERMONETA OVERLOOKING THE PLAIN

Perched on top of a rocky mountain, strongly fortified with towers, crenelated walls, and drawbridges, it defied all enemies for hundreds of years (see text, page 369, and illustrations, page 370).



THE TOWER OF PRINCESS NINFA, WITH NINFA LAKE IN THE FOREGROUND

These ivy-clad ruins date from the twelfth and thirteenth centuries. The adjacent town was destroyed during the wars of the Great Schism of the West in 1381 and not rebuilt on account of the malaria (see the legend of Malaria, page 374). A few miles from Ninfa was ancient Tres Tabernæ, where the Apostle Paul was met by friends from Rome after his shipwreck on the island of Malta (see Acts xxviii: 15).

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which is supposed to have been brought over by Hannibal about 200 B. C.

These animals breed wonderfully in the marshes. They are driven into the canals, where they swim about with evident satisfaction, and while paddling around uproot the plants with their hoofs.

When their services are not thus employed, they haul heavy loads and intelligently perform their duties, directed by the voice of their driver (pp. 368, 369).

New Italy intends now to tackle the problem of draining the marshes that has baffled each succeeding generation for more than two thousand years. The Government is approaching it with all the means and technical knowledge of modern times and will accomplish the work.

The ancient canal of Rio Martino will be opened again, the mountain streams will be placed under control by building a reservoir at the foot of the mountains, and large pumping stations are to be erected for draining the swampy land that is practically at sea-level. I am sorry that there is not space for me to go into the details of this gigantic enterprise, which will cost upward of three hundred million lire.

THE LEGEND OF MALARIA

Meanwhile the derelict region is hopefully waiting. There lies romantic Ninfa, one of the most conspicuous victims of malaria. The deserted street winding between the houses and the towers and churches in ruins tell us the tale of a population that fled to the mountains to escape death.

The city walls that withstood many attacks have crumbled beneath the onslaught of the elements, and the only building that still is habitable is the municipal hall, which I have transformed into my private dwelling (see page 371). In front of it flows the crystalline river Ninfa that, a few yards distant, springs out of the rocks at the bottom of a charming little lake and flows through the abandoned city, while branches of ivy, brambles, vines, and roses hang down from the ruins to play in the running water.

Romantic Ninfa has created a charming legend that I wish to relate to you, as it symbolizes the malaria. It is quite an old legend.

Once upon a time there was a king who was lord of all the Pontine Marshes. He had a beautiful daughter, Ninfa. Happy he would have been if his kingdom had not been swamped by the waters and infested by the malaria.

Two kings came to woo the beautiful Ninfa; they were King Moor and King Martino. The father said: "I will give the girl to him who first succeeds in draining the water off my land."

King Martino called all the men of his kingdom and set to work digging out the Rio Martino, that big canal which I mentioned previously (see page 368). King Moor did nothing but court the beautiful girl. She, however, loved the man who was working so hard to win her.

When King Martino was about to finish his great canal, Ninfa one day said a few sarcastic words to King Moor on account of his laziness and told him how glad she was to be sure now that she would become King Martino's wife.

Without a word King Moor raised a magic wand and waved it toward the distant Mount Circeo, saying: "Flow off, waters, flow to the sea!" and immediately the waters started toward the south, and in a few hours the land was dry.

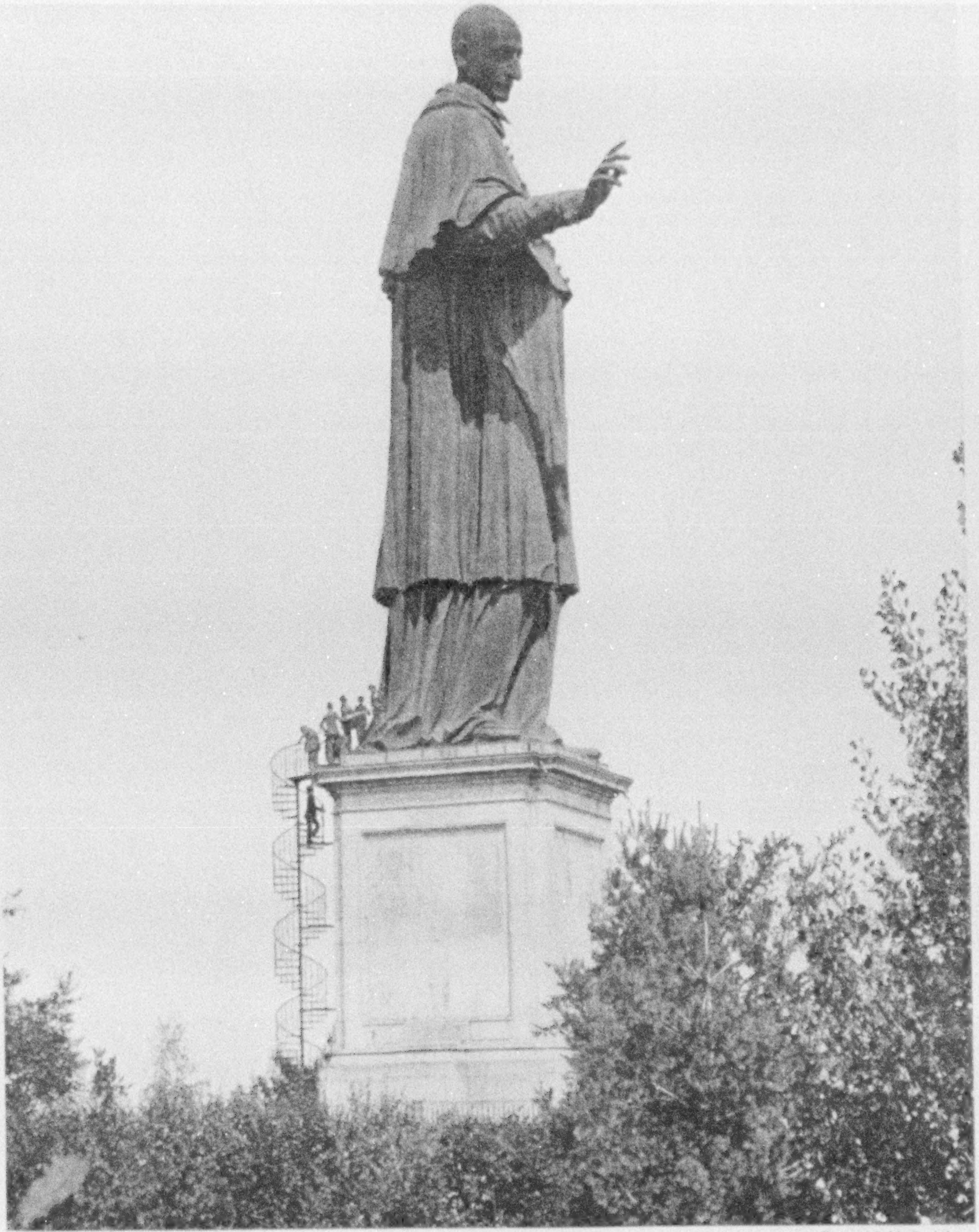
The girl's father, in accordance with his promise, had to give Ninfa to King Moor; but the beautiful maiden was so grief-stricken that she fled to a little lake that now bears her name. She climbed to the top of the high tower that rises on the edge of the water, and from the embattlements, with a cry of despair, threw herself into the opal-blue water below.

But Ninfa did not die. She still lives in the depth of the waters, among the long algæ that rise from the silt, and she makes her abode in that big cavern that is at the bottom of the lake, from which the water gushes out in big waves.

There she remains in hiding during the day, and only at sunset, when the malaria is most treacherous, she comes to the surface of the water near the road and suddenly shows herself to weary young men who are returning to their homes after their daily tasks.

The young men stop amazed and gaze at this wonderful figure, but misfortune befalls them, for instantly they wither and grow old.

This is the legend of Ninfa, the sad legend of the malaria.



Photograph by Donald McLeish

THE COLOSSAL STATUE ERECTED TO SAINT CARLO BORROMEO AT ARONA, ON LAKE MAGGIORE

This celebrated cardinal-archbishop, famous for his labors among the plague-stricken inhabitants of Milan, was born in Arona in 1538. The statue is 75 feet in height and stands on a pedestal 42 feet high. A stairway leads up the interior of the figure and the visitor may climb to the head. The head, hands, and feet are of bronze and the robe is of wrought copper. It was Cardinal Carlo who consecrated the great cathedral of Milan in 1577 (see page 381).

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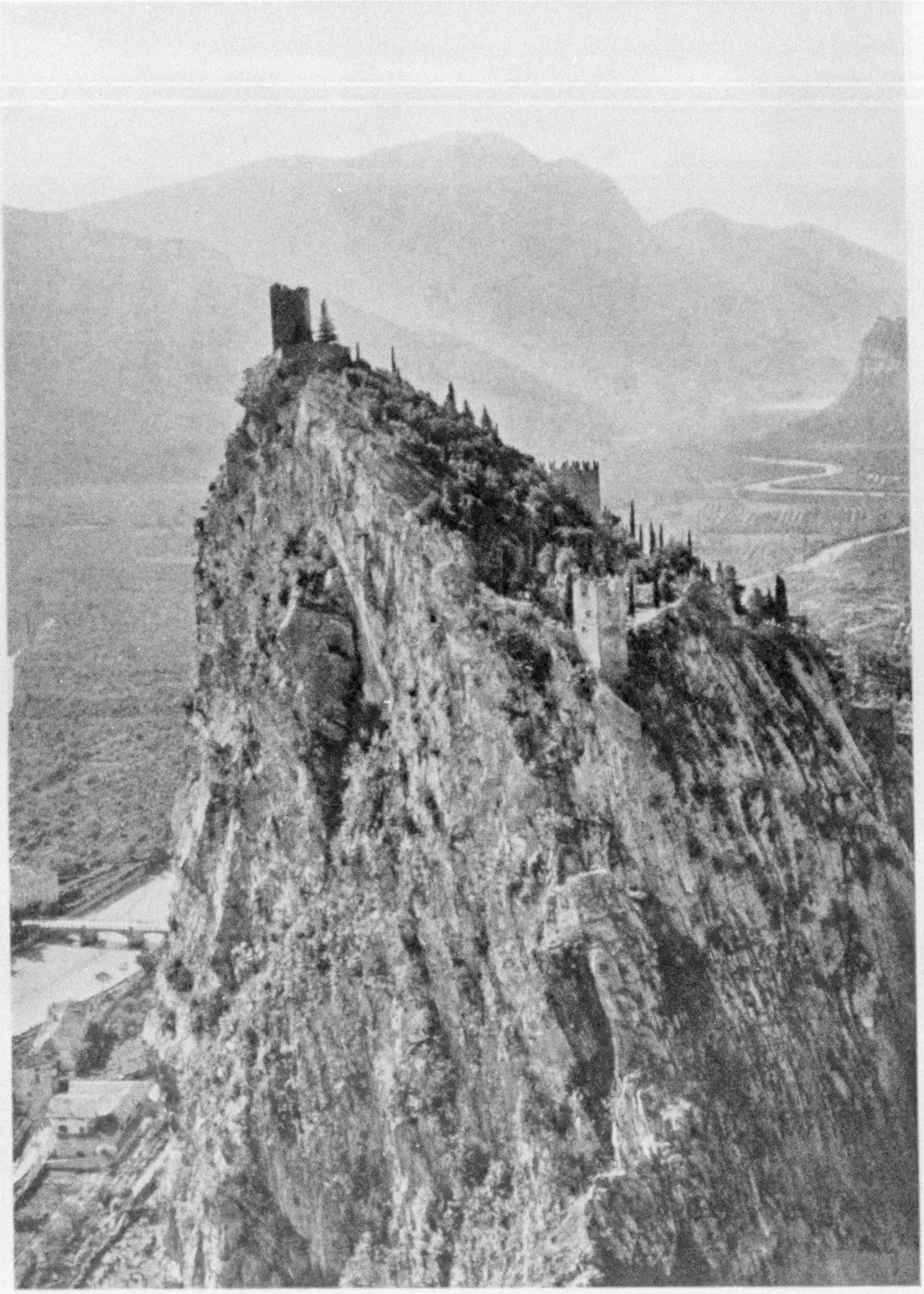
Photograph by Donald McLeish

VENETIAN TRADING BOATS CROSSING THE LAGOON FROM MALAMOCCO TO VENICE

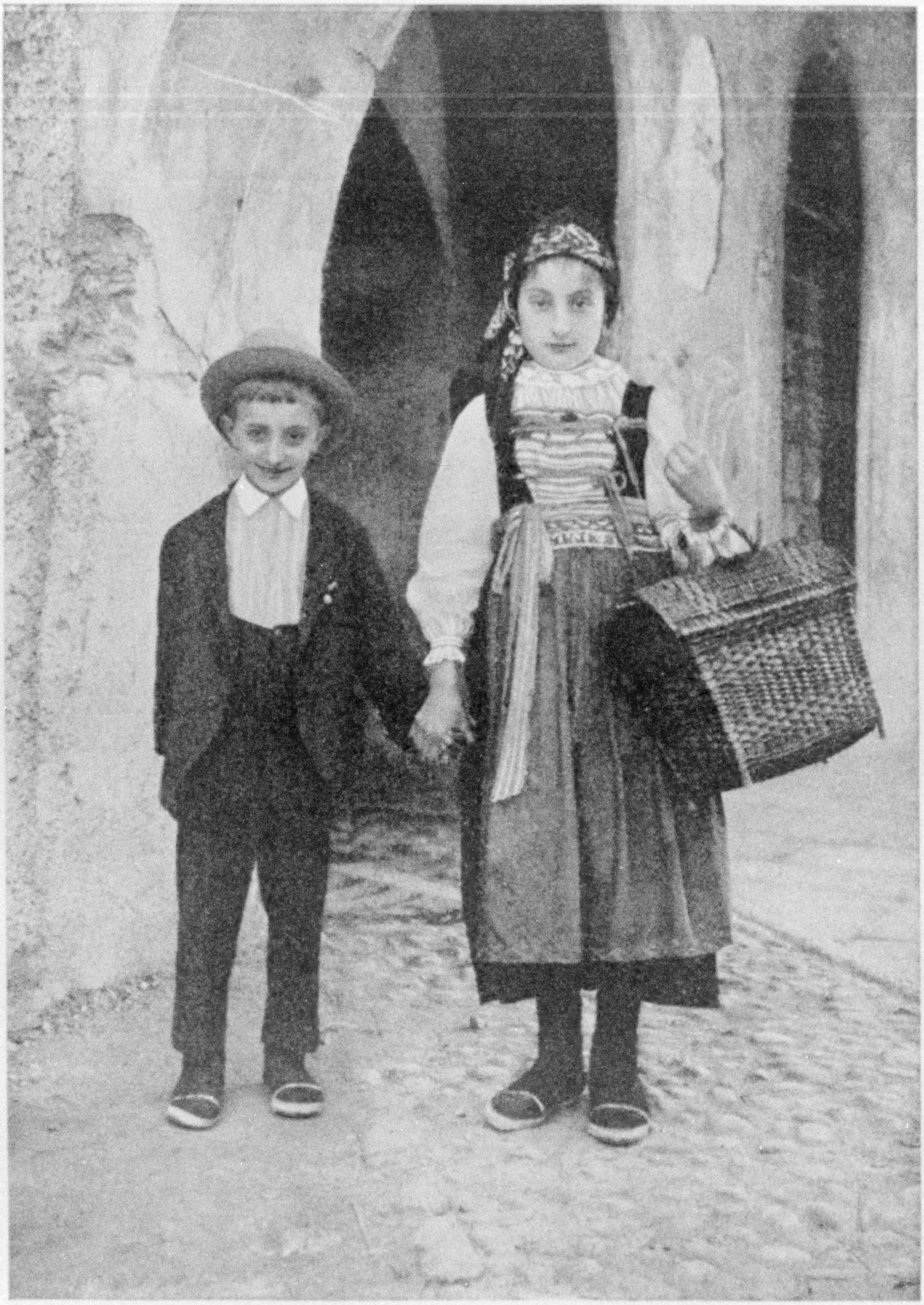
The town of Malamocco, five miles from Venice, is situated near the site of the island of the same name, which was formerly the capital of the confederacy of islands that gave birth to the Republic of Venice. The government of the confederacy was removed from Malamocco to the island of Rivoalto (Rialto) in 811. Thus Venice was founded.



Photograph by Kilophot

ARCO AND ITS CASTLE

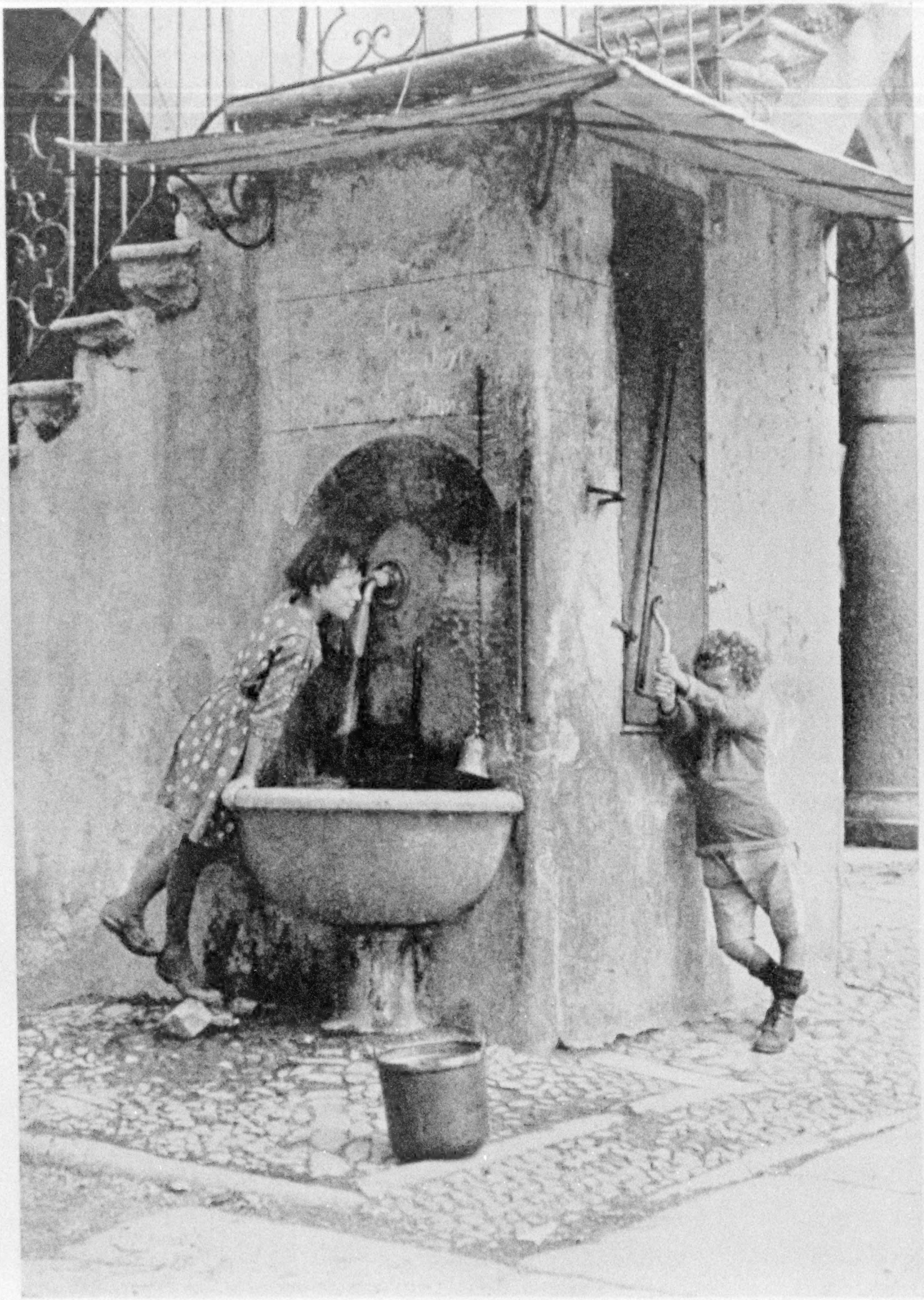
Said to have been built either by the Romans or by Theodoric the Great, king of the Ostrogoths, this castle overlooks the town of Arco, on the banks of the Sarca, which flows into Lake Garda. As a winter resort, Arco is attractive. Roses bloom out of doors even in December, almonds ripen in February, and peaches, apricots, and pears appear in March.



Photograph by Donald McLeish

PEASANT CHILDREN OF THE STRONA VALLEY, NORTHERN ITALY

The Strona, rising near the Swiss border, flows into the Lake of Orta, a lovely body of water a few miles west of Lake Maggiore.



Photograph by Donald McLeish

"TAKING THE WATERS" AT THE VILLAGE FOUNTAIN

These children live in the little town of Orta, on the banks of the charming lake of the same name (see also pages 378 and 380).

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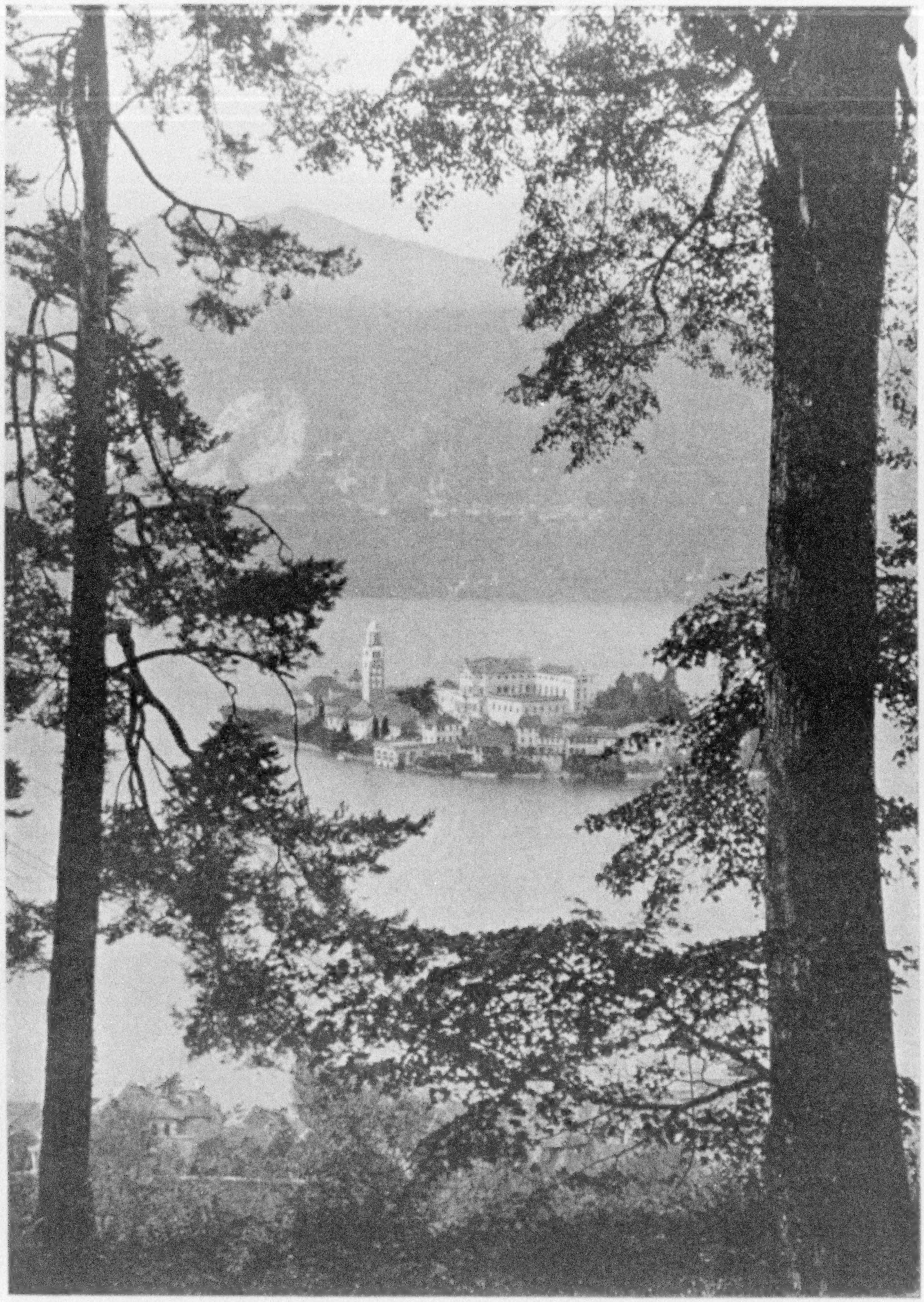
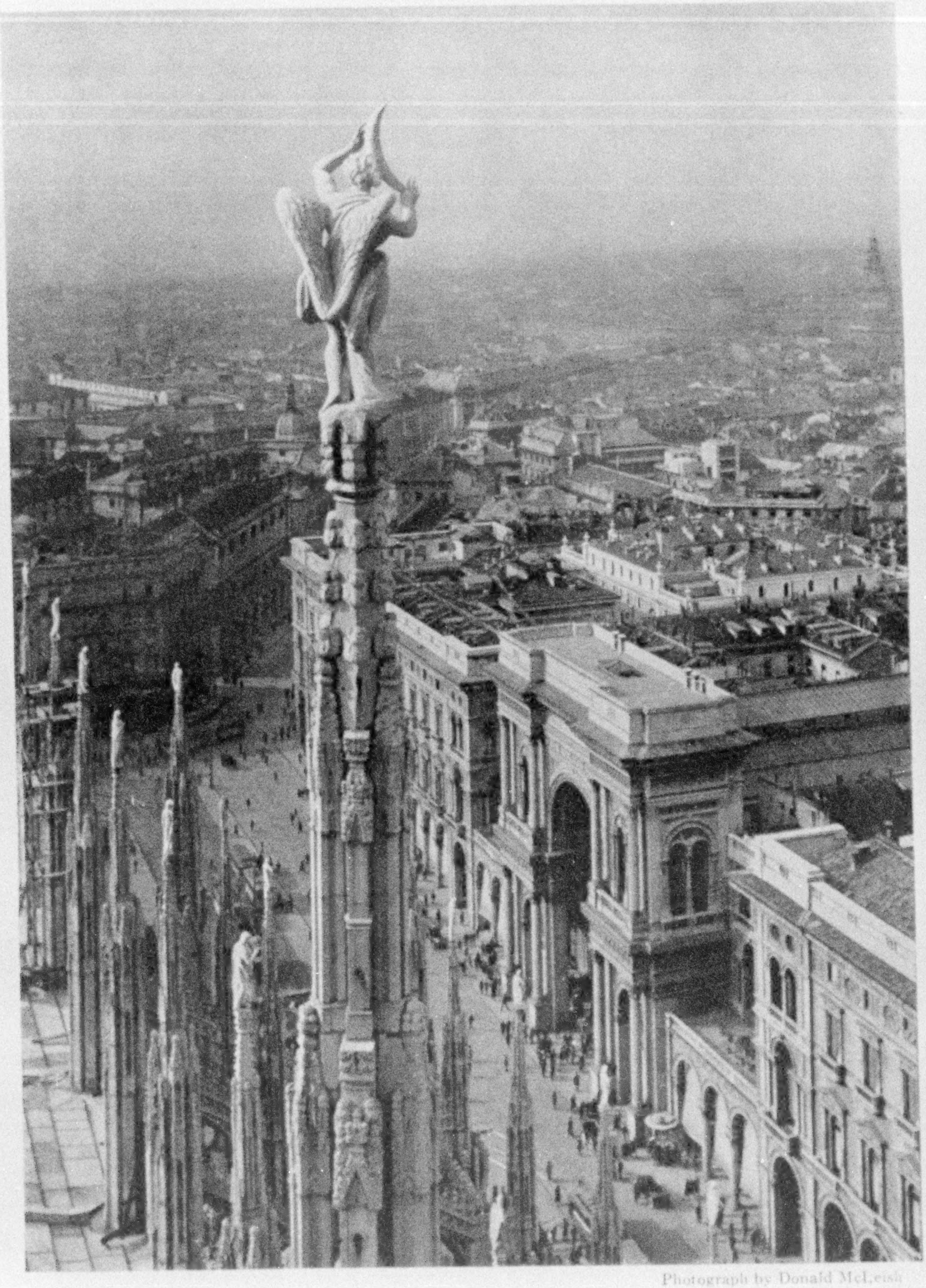


Photograph by Donald McLeish

SAN GIULIO, A BEAUTY SPOT OF NORTHERN ITALY

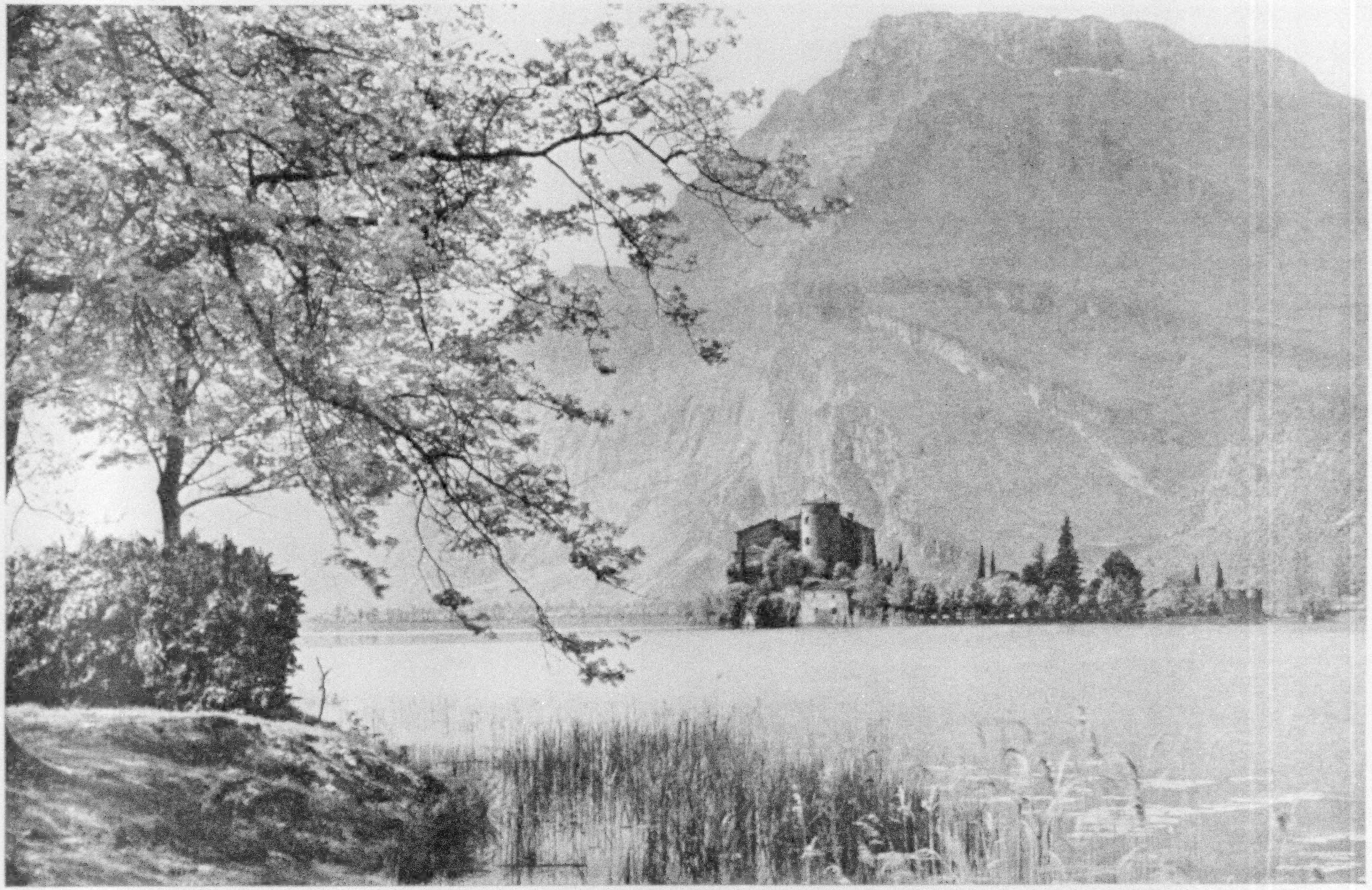
A view of the Lake of Orta from a summit above the town of Orta, showing the island of St. Julius, with its monastery and church. The latter was founded by St. Julius, who came to this region to convert the natives in 379 A. D.



Photograph by Donald McLeish

"THE ANGEL OF MILAN"

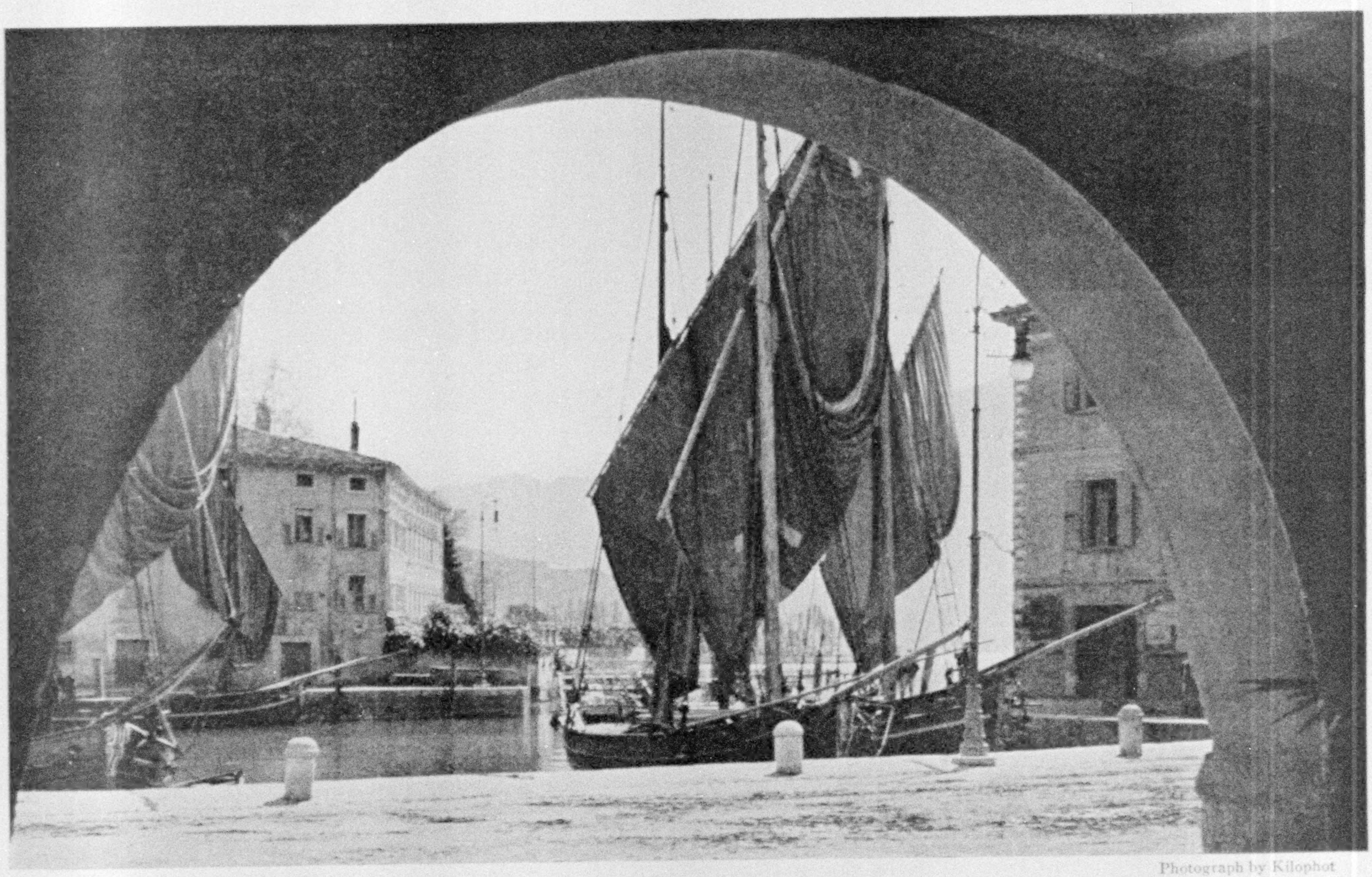
One of the 2,300 marble statues which adorn the 135 spires of the world's third largest cathedral. Two hundred feet below is seen the entrance to the Galleria Vittorio Emanuele, the largest and loftiest arcade in Europe.



Photograph by Kilophot

THE CASTLE TOBLINO, ON LAKE TOBLINO, NORTHERN ITALY

One of the lake resorts which was returned to Italy by Austria under the provisions of the St. Germain Treaty in 1919.



Photograph by Kilophot

THE HARBOR OF RIVA, ON LAKE GARDA

This delightfully situated town belonged to Austria for more than 100 years—from 1815 until the signing of the Treaty of St. Germain, by which Austria restored the Trentino to Italy (see also pages 382 and 384).

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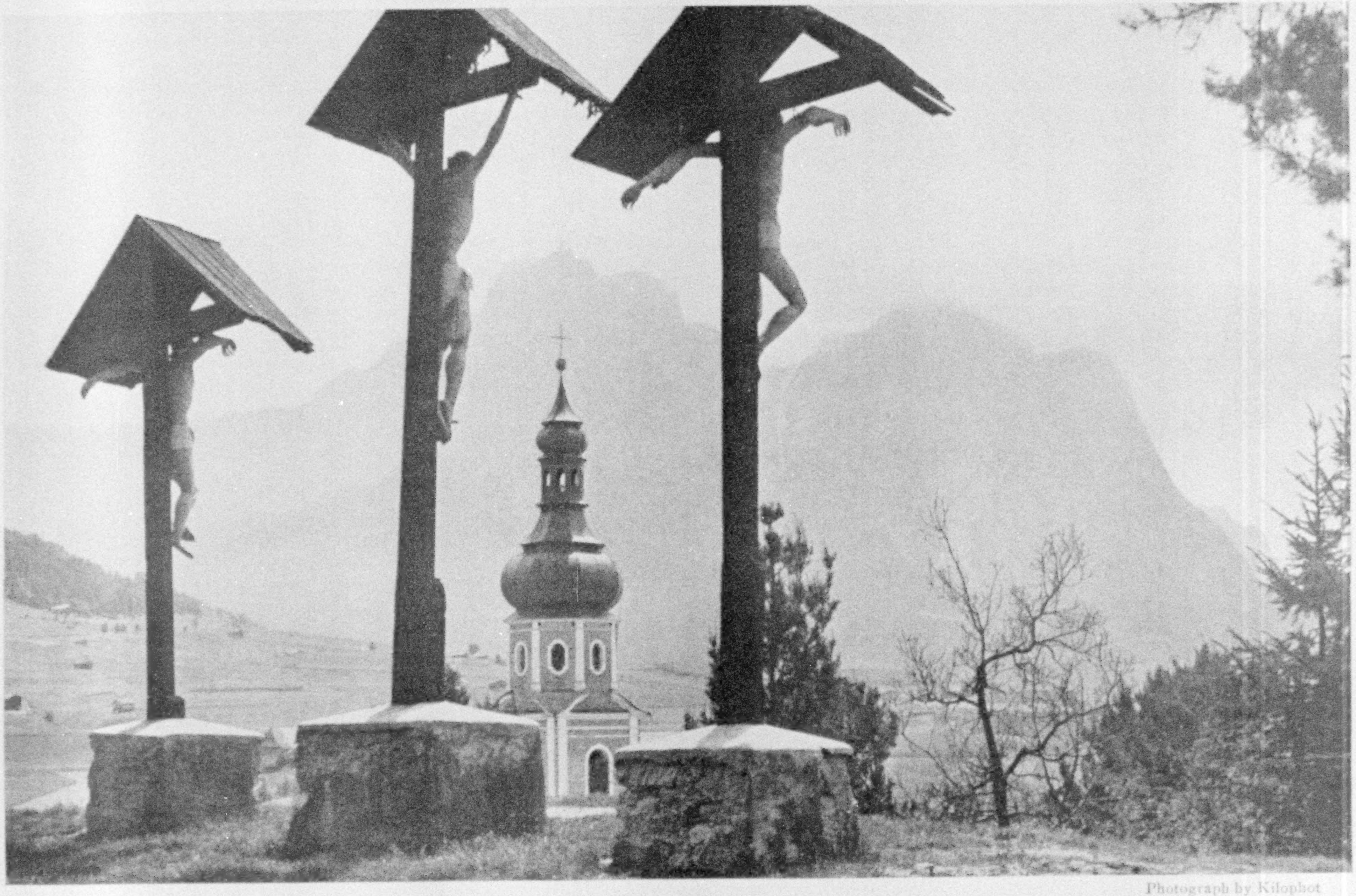
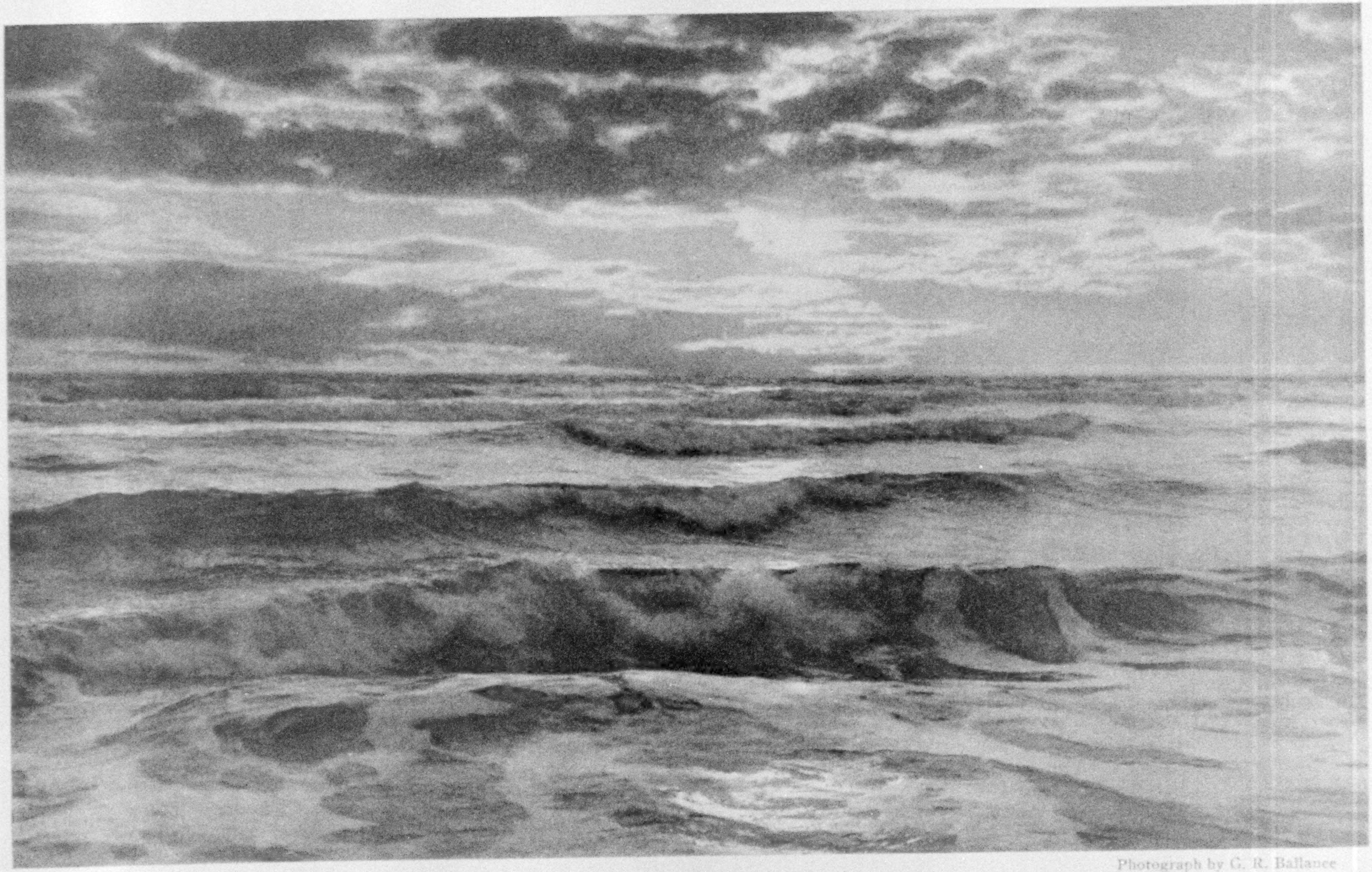


Photograph by Kilophot

MOUNT CALVARY, OVERLOOKING CASTELROTTO

When this town belonged to Austria, prior to 1919, it was known as Kastelruth. It is the old Roman stronghold, Kastellum Ruptum, set on a green knoll with a grass-grown belt of masonry. Below is a crooked lane of houses with high-pitched gables and out-thrust windows all askew, projecting signs, and frescoed saints. The medieval costume for the men of the town is a resplendent sight—shoes of white leather with broad red tongues, plum-color coats faced with scarlet, and hats of yellow felt, gay with ribbons, flowers, feathers, and gold lace. This hill is the scene of religious processions at Eastertime.



Photograph by G. R. Ballance

A ROUGH SEA AT BORDIGHERA, ON THE ITALIAN RIVIERA

Bordighera is only three and a half miles east of Ventimiglia, at the French frontier. It is famous for its roses, carnations, and anemones, and for palm branches, which are bleached on the trees and sold to the churches of Italy for Palm Sunday.

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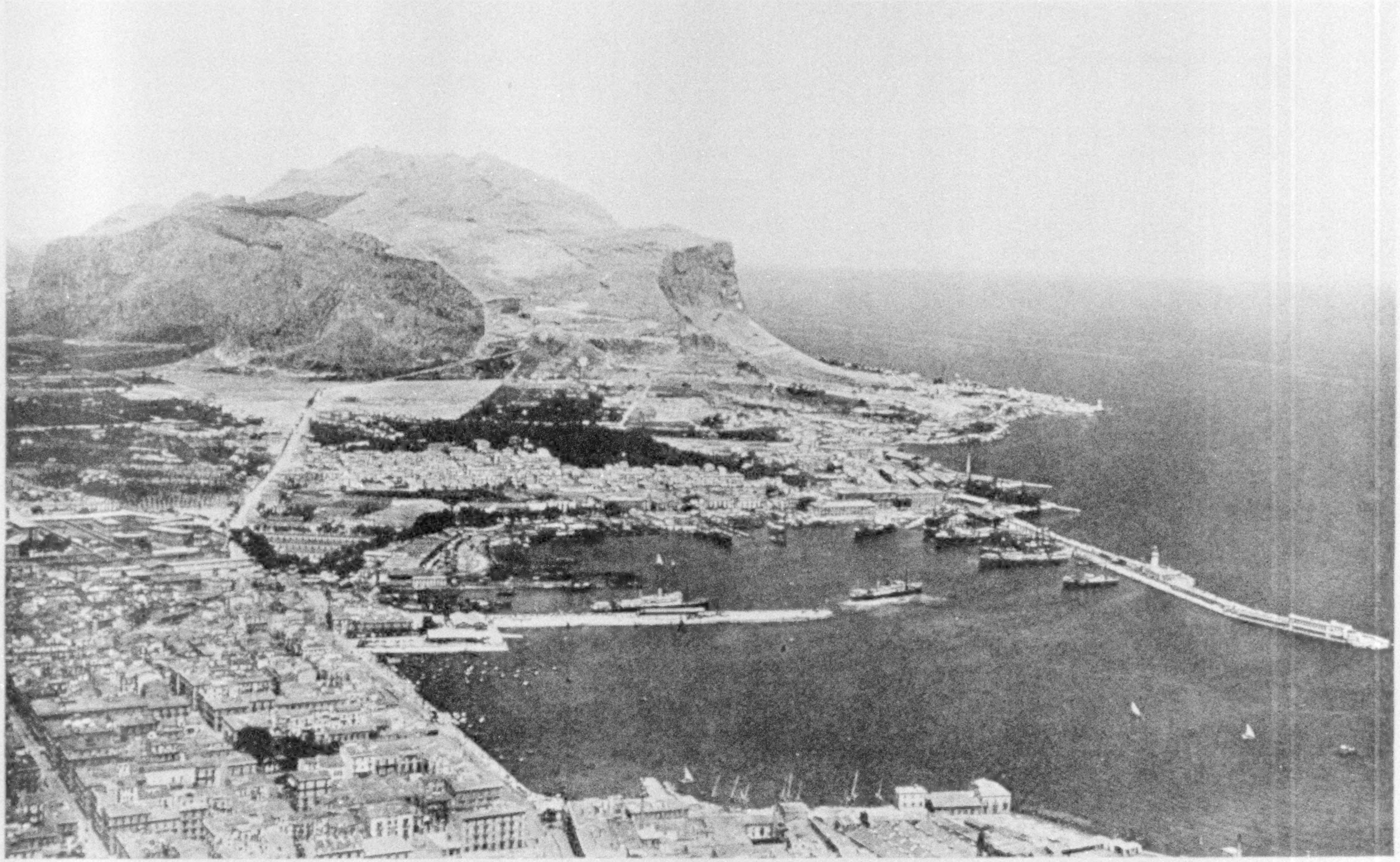
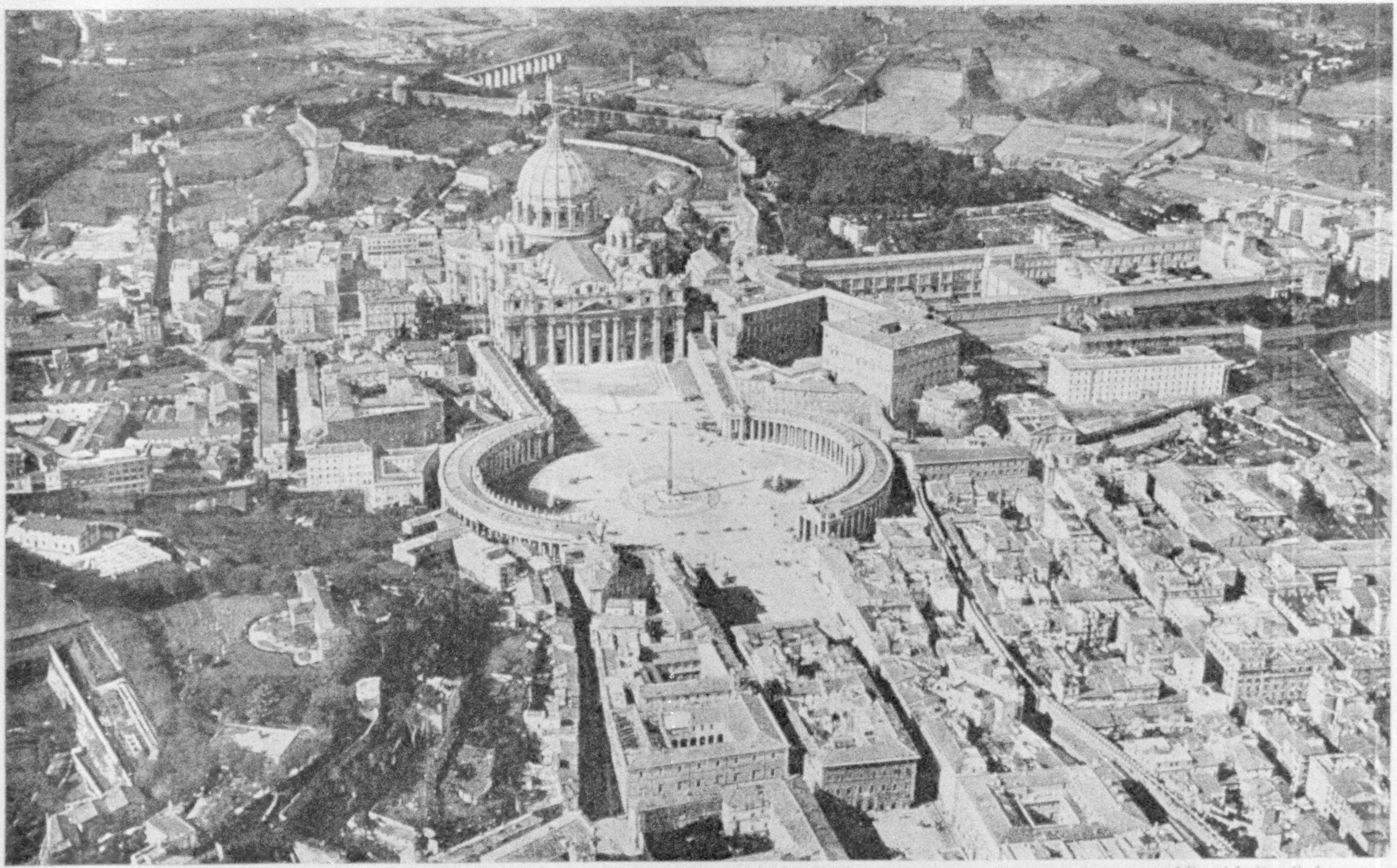


Photograph courtesy of Royal Italian Embassy

PALERMO, METROPOLIS OF SICILY, PHOTOGRAPHED FROM THE LATE DIRIGIBLE "ROMA"

This beautiful city has been coveted by many nations. It was originally a Phœnician settlement and for centuries was the head of the Carthaginian dominion in Sicily (see pages 391-423). Romans, Ostrogoths, Arabs, Byzantines, Normans, Germans, French, Spaniards, and Italians have held sway here. At one time Hamilcar, the Carthaginian, was encamped for three years on Hiercte, or Pellegrino, the rocky eminence in the background, in a vain effort to dislodge the Romans from the city.



Photograph courtesy of Royal Italian Embassy

ROME: A VIEW OF ST. PETER'S FROM THE AIR. THE VATICAN AND THE PAPAL GARDENS ARE TO BE SEEN IN THE RIGHT BACKGROUND

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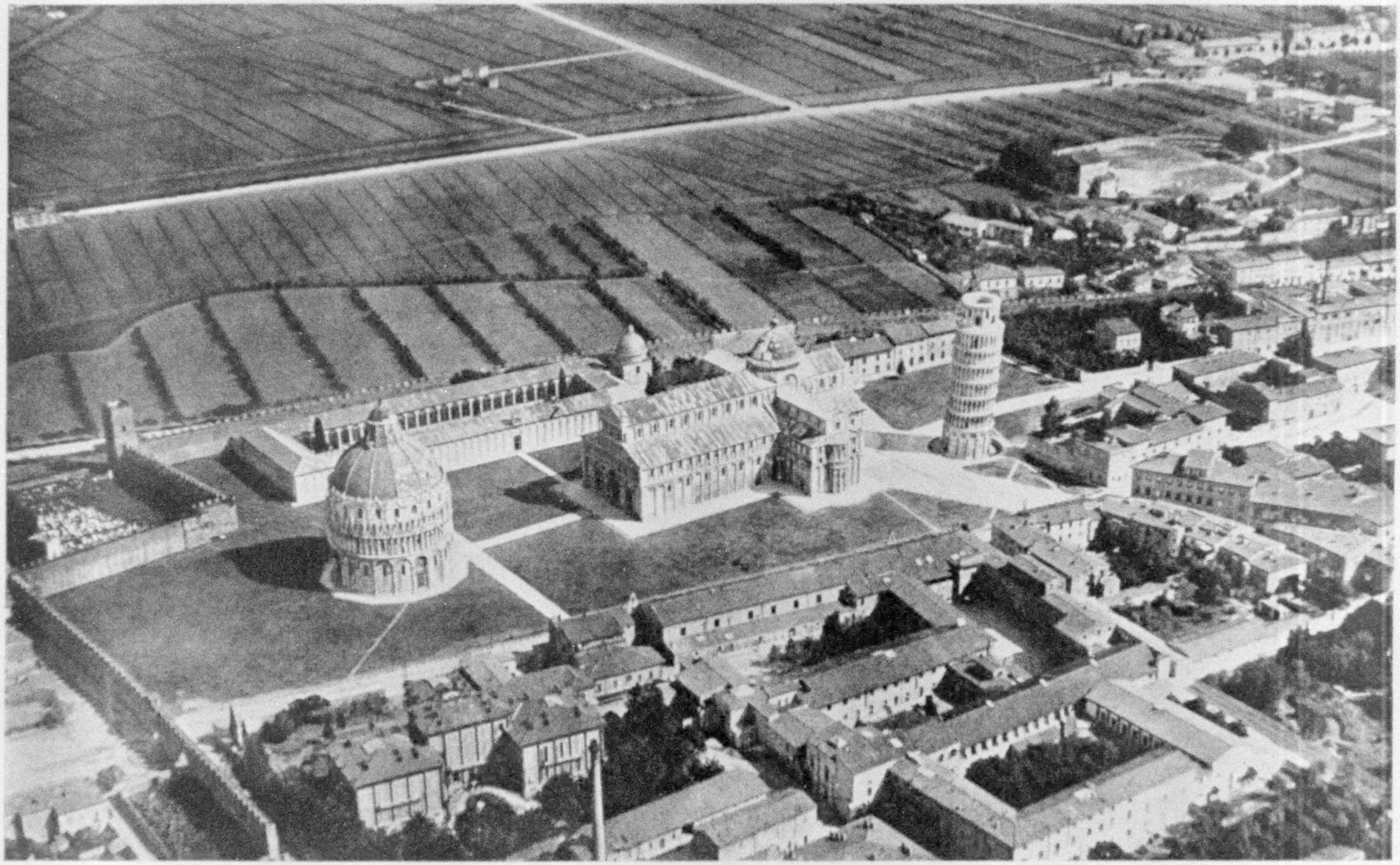
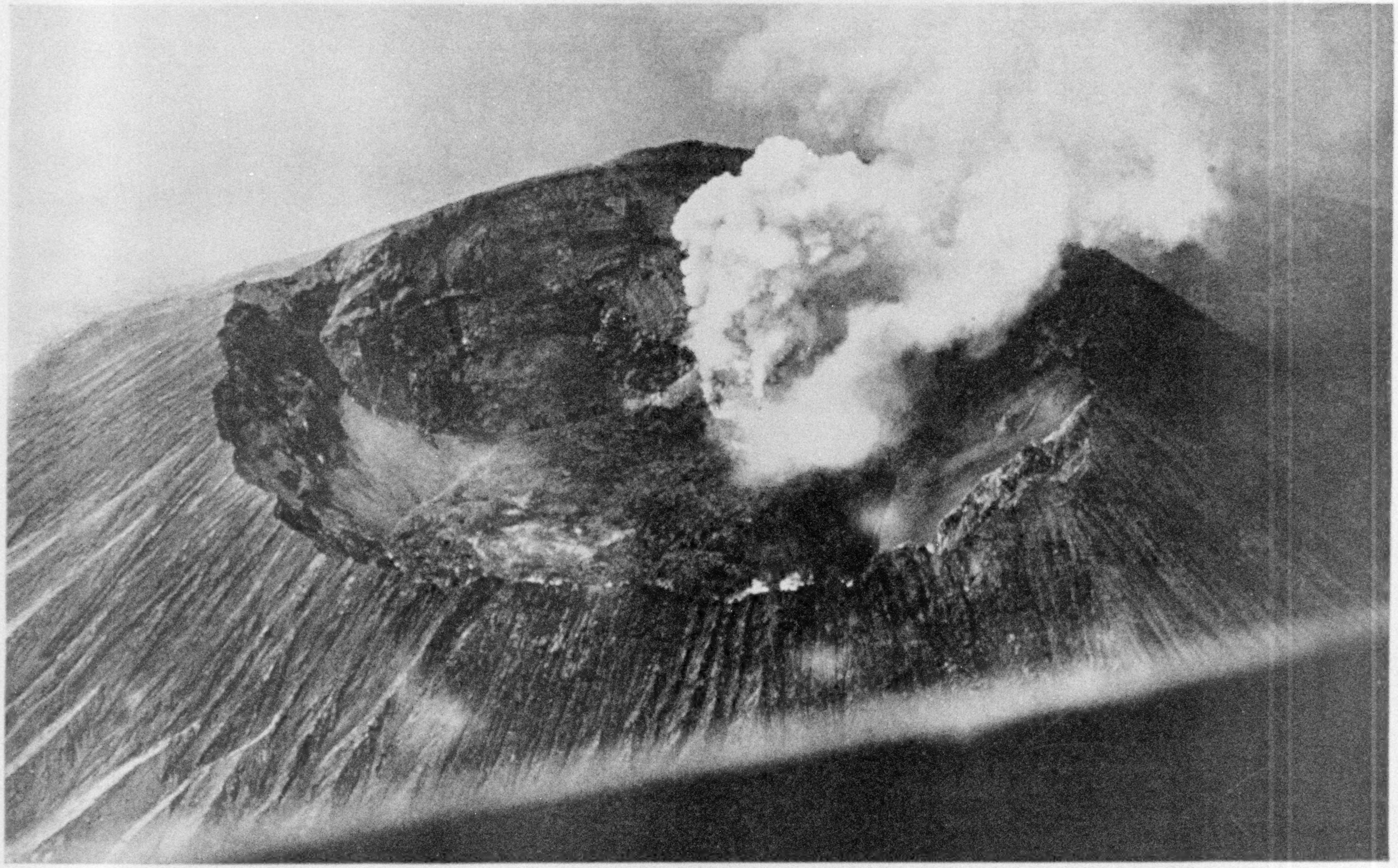


Photograph courtesy of Royal Italian Embassy

PISA SEEN FROM AN AIRPLANE

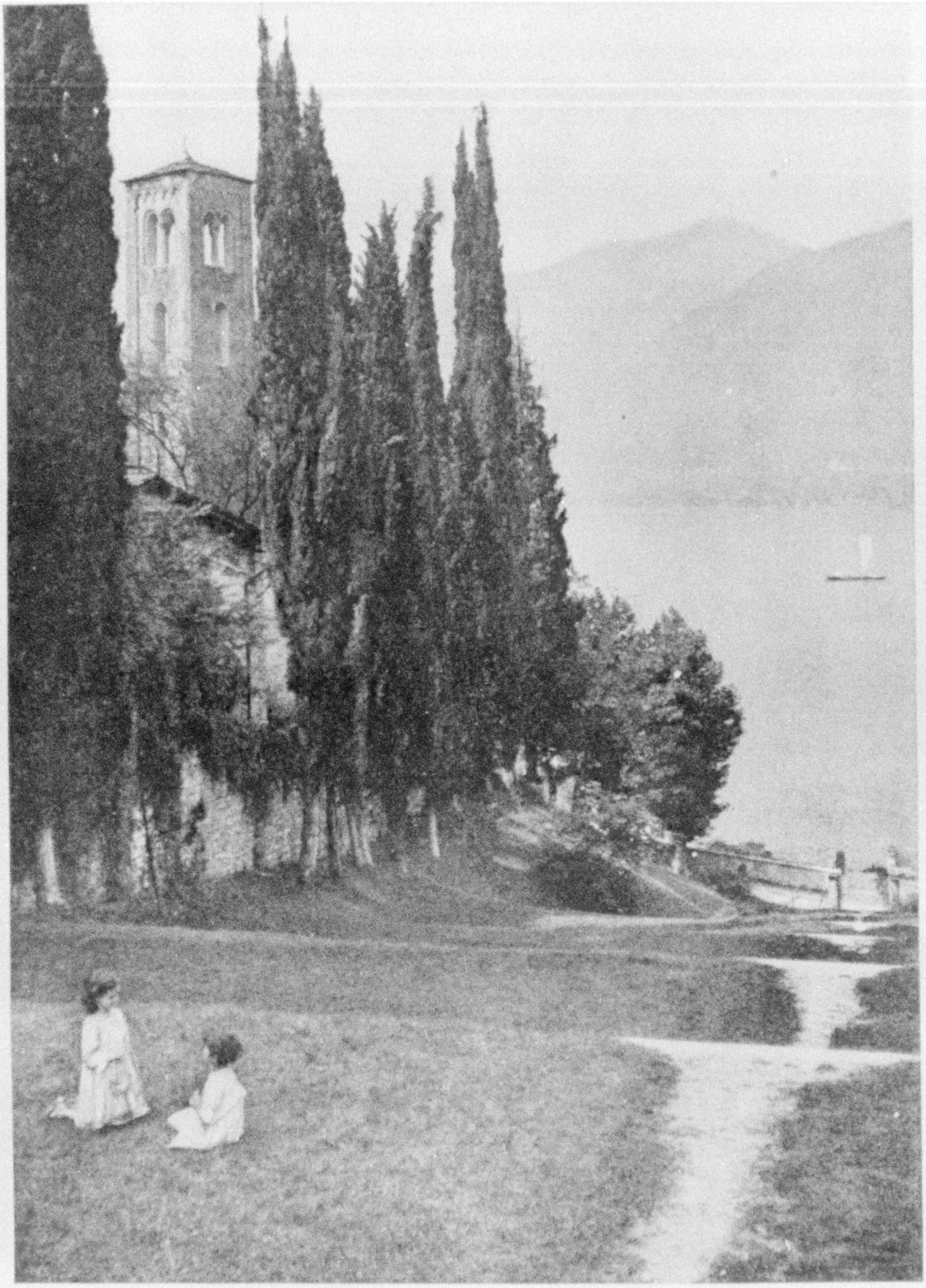
The beautiful circular structure to the left is the 12th-13th century Baptistery, built almost entirely of white marble; in the center is the Cathedral, also of marble, and to the right the Leaning Tower, one of the Seven Wonders of the ancient world.



Photograph courtesy of Royal Italian Embassy

VESUVIUS IN ERUPTION

The world's most famous active volcano as seen from a dirigible.



Photograph by Donald McLeish

THE ANCIENT CHAPEL AND MAUSOLEUM OF THE GONZAGAS, NEAR BELLAGIO, OVERLOOKING LAKE COMO

In the distance rises Monte Crocione. This is one of the most celebrated beauty spots among the lakes of northern Italy.

ANCIENT CARTHAGE IN THE LIGHT OF MODERN EXCAVATION

By Count Byron Khun de Prorok

FEW sites of antiquity have a more illustrious history than the peninsula on which lie the accumulated ruins of the dead cities of Carthage. Phœnicians, Berbers, Numidians, Romans, Vandals, Byzantine crusaders, and, lastly, the Arabs have all left their traces, and to-day in the strata of thirty centuries lie the mute evidences of long racial warfare and the dethronement of past splendors.

Here, where peace now reigns over the marble dust, is a natural beauty and grandeur equal to any of the famous scenes along the Mediterranean shore, and the panorama viewed from Cape Carthage explains Queen Dido's selection of the site, in the ninth century B. C., for the first Punic city of Carthage.

From the summit of the ancient hill called Byrsa (meaning "hide," and reminiscent of the Dido story of the bull skin, see page 398) is unfolded the landscape which was once the scene of the great tragedy of the Mediterranean. To the east lies the magnificent Gulf of Tunis, of azure blue shading off into emerald green near the shores (see map, page 394).

On the opposite bank rise the majestic twin summits of the sacred mountain of the Carthaginians, the Bou-Kornein (see page 399). There stood the temple dedicated to Baal, but only a few stones mark the spot where the flames of votive offerings once paid homage to the insatiable Phœnician gods.

To the south, in an amphitheater surrounded by purple mountains, its hundred minarets reflected in the Tunis lagoon, lies "the White Mantle of the Prophet," as the Arabs call the city of Tunis to-day (see Color Plates, pages 415 to 422).

The picturesque village of Sidi-bou-Said crowns the northern promontory of Cape Carthage (see illustration, page 395). It looks somewhat like a white dove, the sacred symbol of the Carthaginians, for its roofs and domes spread out like wings above the blood-red precipices that stand sentinels above the entrance to the Gulf of Tunis.

This is the scene so often gazed upon by Dido, Pyrrhus, Hasdrubal, Hamilcar, Hannibal, Scipio, Cæsar, Cyprian, Augustine, Genseric, and St. Louis, and its history is made still more eloquent by the resurrection of its buried ruins.

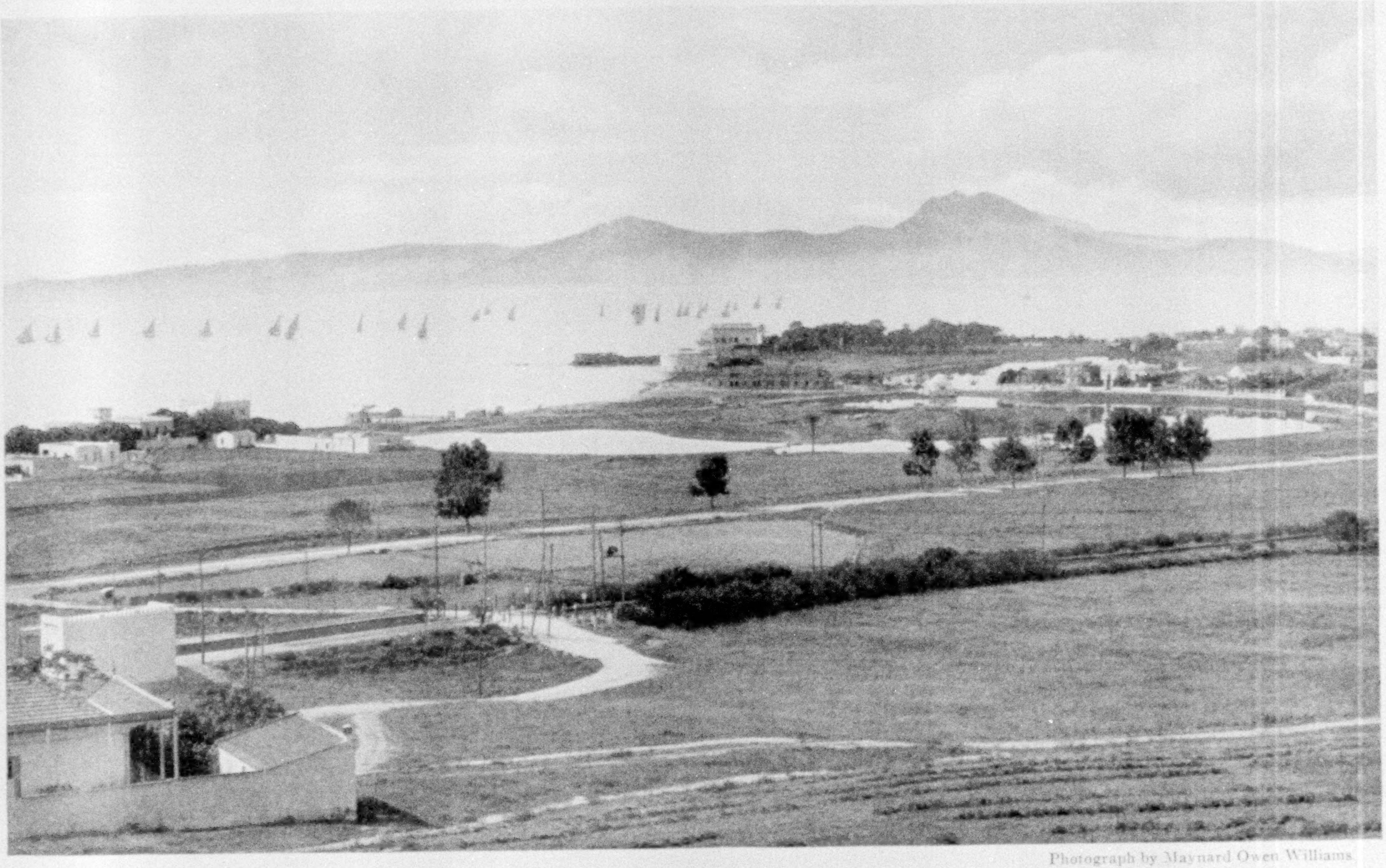
The excavation of Carthage is difficult because of the great topographical changes that have taken place since Punic days. For these changes the Medjerda River is responsible to a considerable degree, as its alluvial deposits have encroached upon a large part of the peninsula, completely covering a portion of land which in all probability was once occupied by the city. To-day the Arabs still call these marshes Bahar el Azrag, meaning "the Blue Sea."

WHERE THE MIGHTY FLEETS OF THE CANAANITES ANCHORED

From motion-picture films taken by airplane last summer it is quite evident that there are vast submarine walls at Cape Kamart, to the northwest of the peninsula (see map, page 394). Excavations at this point, it is believed, will throw some light on the old baffling mystery as to the site of the Punic ports, where the mighty merchant fleets of the Canaanites plied to and fro. (As may be remembered, the Phœnician, whose Roman name was "Punicus," was a native of Canaan, in the lowlands of Palestine, prior to the invasion of the Jews.)

According to the descriptions of Appian and other Roman historians, we know the ports to have been circular at one time, with the admiral's military palace in the center, and at another period quadrilateral. It is said that as many as 220 galleys could be anchored at one time in the harbor. Actually a series of harbors, they were of imposing architecture and were marked off by gigantic columns, between which the ships were moored.

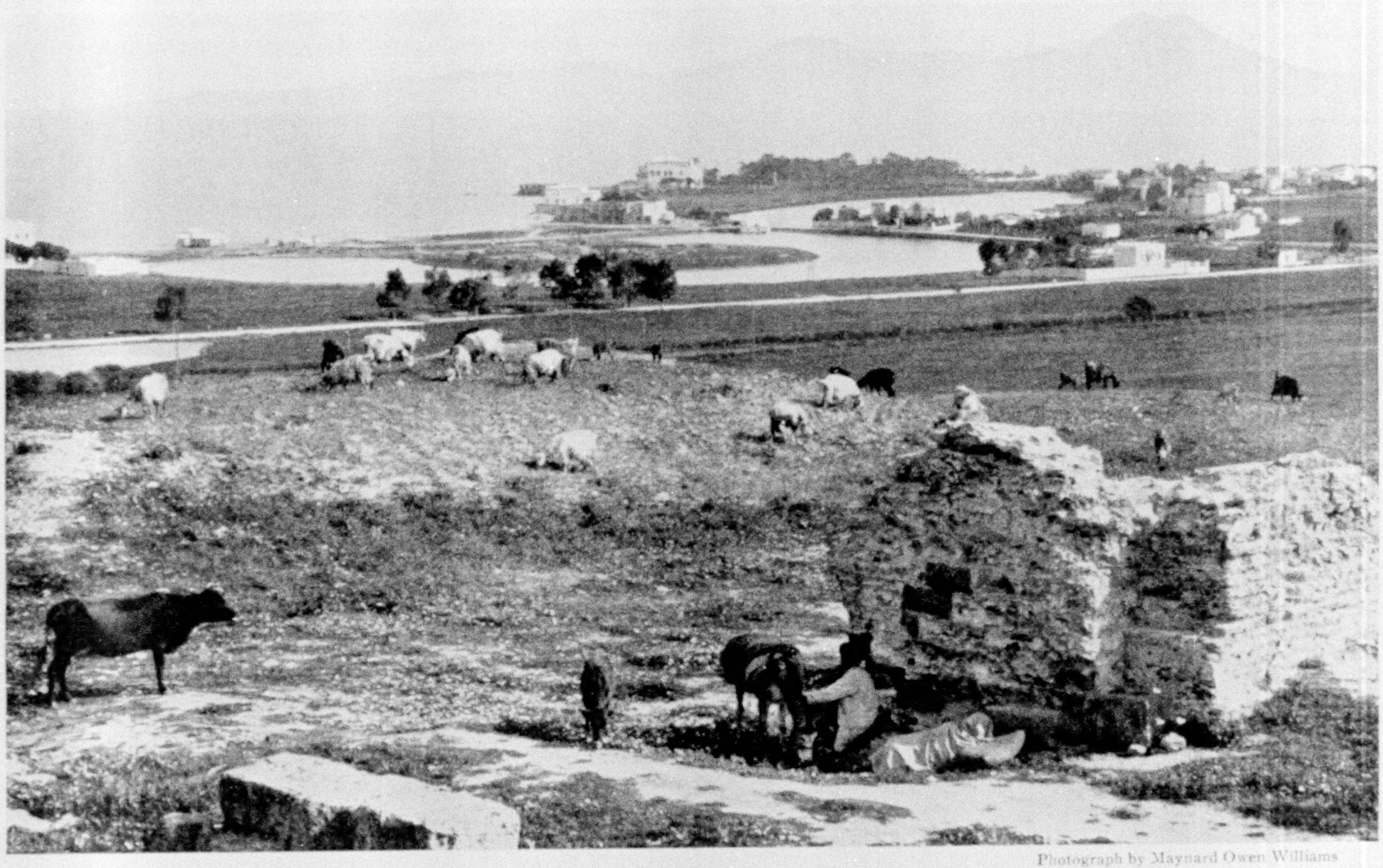
The sea has risen three and one-half yards since Roman days, and there are many ruins under water in the gulf and at La Marsa, north of the rebuilt city.



Photograph by Maynard Owen Williams

THE PUNIC PORTS AND A MODERN FISHING FLEET FROM LA GOULETTE BECALMED IN THE EARLY MORNING

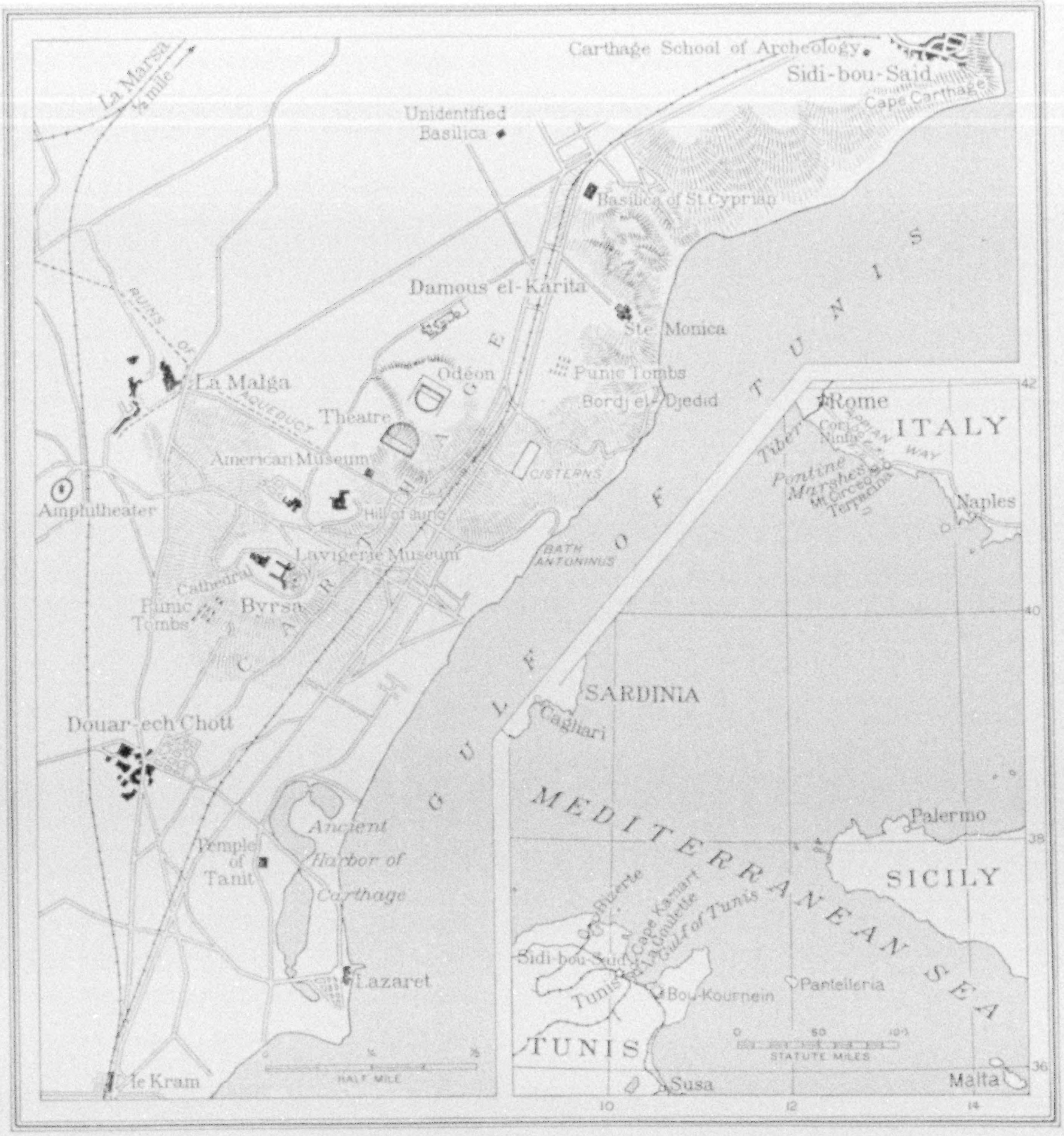
These Arab dhows are passing to-day in the tracks of the ancient fleets of Carthage, Rome, Byzantium, the Vandals, and the Barbary pirates.



Photograph by Maynard Owen Williams

LOOKING SOUTH FROM THE BYRSA

Authorities differ as to the origin and date of the masonry here shown. It is probably not Punic, but Roman. From this point one has an excellent view of the Punic ports in the plain.

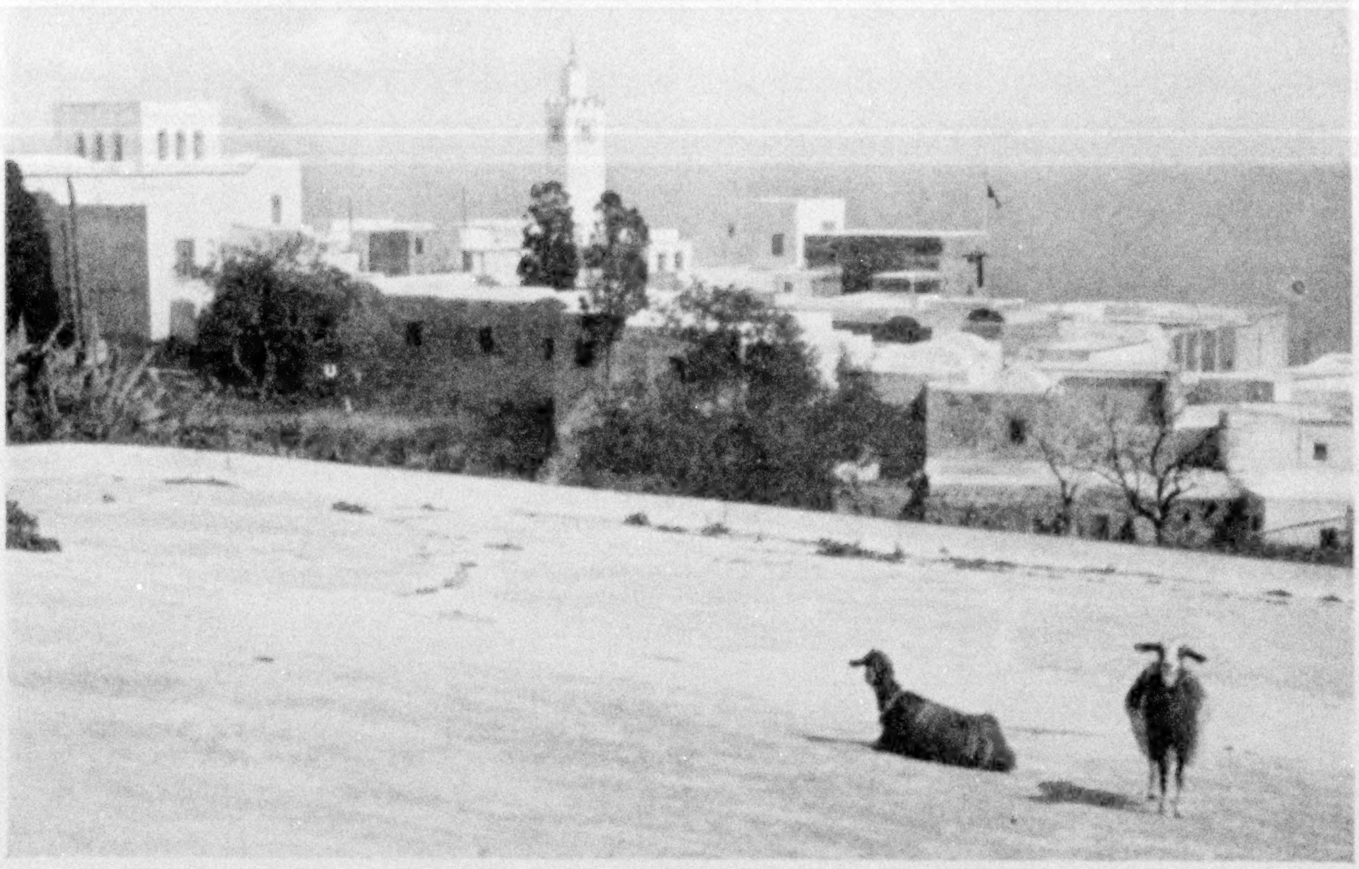

Carthage School of Archeology
Sidi-bou-Said
Cape Carthage
La Marsa ½ mile
Unidentified Basilica
Basilica of St. Cyprian
Damous el-Karita
Ste Monica
Ruins of Aqueduct
La Malga
Odeon
Punic Tombs
Bordj el-Djedid
Theatre
American Museum
Cisterns
Amphitheater
Hill of Juno
Lavigerie Museum
Bath Antoninus
Cathedral
Punic Tombs
Byrsa
Gulf of Tunis
Douar-ech Chott
Temple of Tanit
Ancient Harbor of Carthage
Lazaret
le Kram
Half Mile
Rome
Italy
Tiber
Appian Way
Pontine Marshes
Naples
Sardinia
Cagliari
Mediterranean Sea
Palermo
Sicily
Sidi-bou-Said
Tunis
La Goulette
Gulf of Tunis
Bou-Kournein
Pantelleria
Tunis
Statute Miles
Susa
Malta

Drawn by A. H. Bumstead

A SKETCH MAP OF THE SITE OF CARTHAGE: ALSO THE PONTINE MARSHES (SEE P. 357)

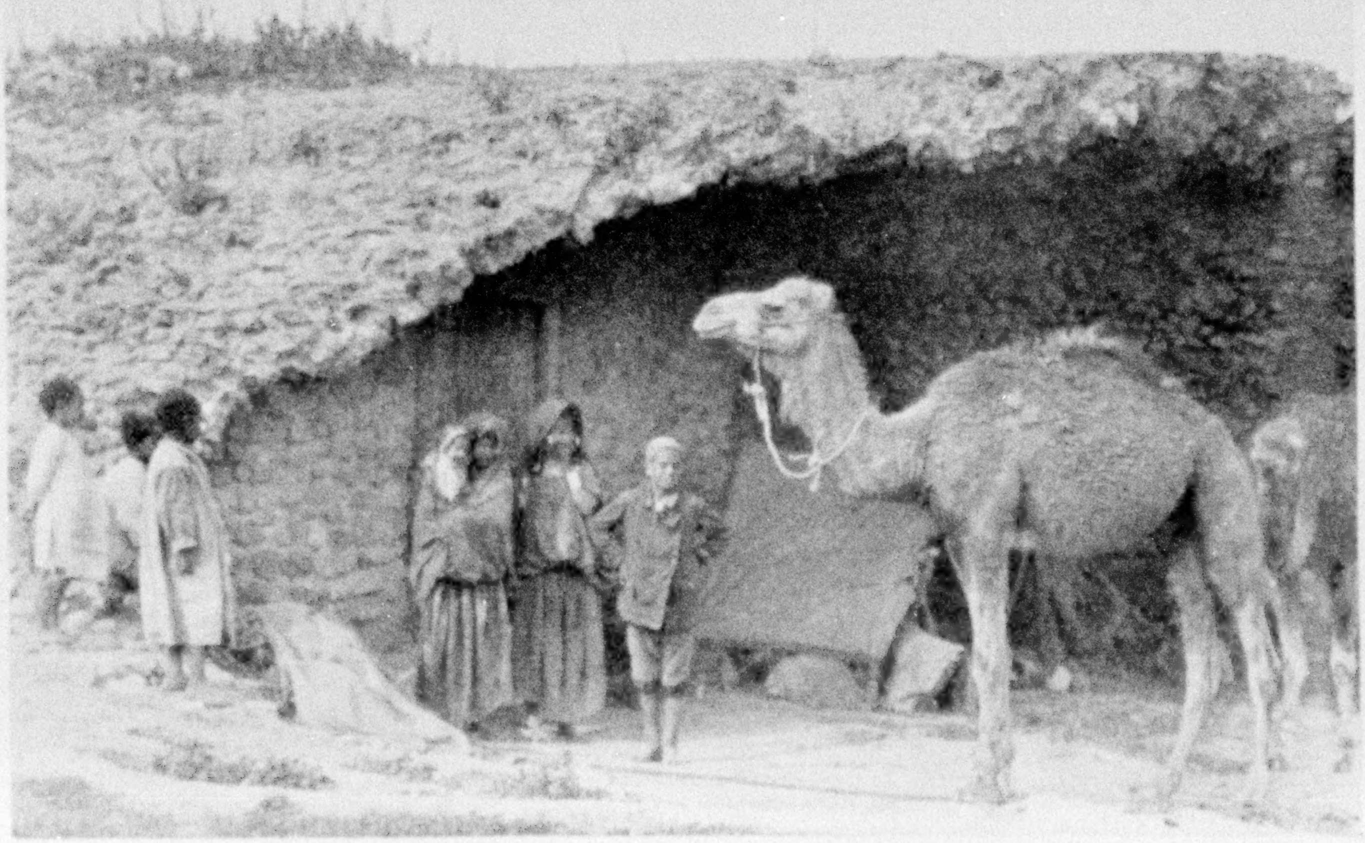
Another obstacle in the way of excavation at Carthage is the alluvial deposits in the hollows between the hills. Here has been an accumulation of earth, sand, and débris at the rate of a *yard a century*. It requires little imagination to appreciate the difficulty of uncovering an edifice buried, say, twenty centuries ago. It is reported that Lord Carnarvon moved 70,000 tons of earth before reaching Tutankhamen's tomb. At Carthage it is singularly impressive to find the traces of so many different peoples, and in this respect no other spot in the world discloses so grippingly the war tragedy of the human race.

The question of when the Egyptians may have occupied this territory can be solved only by the most laborious and prolonged research, since Cambē, the city of the Sidonians, was founded by them six centuries before Dido (really Elissar, daughter of King Mathan of Tyre) settled there with her fugitive Phœnicians, prior to 800 B. C. Cambē was merely a ruin at this time, and history affords nothing beyond the fact of its existence and origin. Sidon had been the principal



LOOKING EAST, TOWARD THE MINARET OF SIDI-BOU-SAÏD

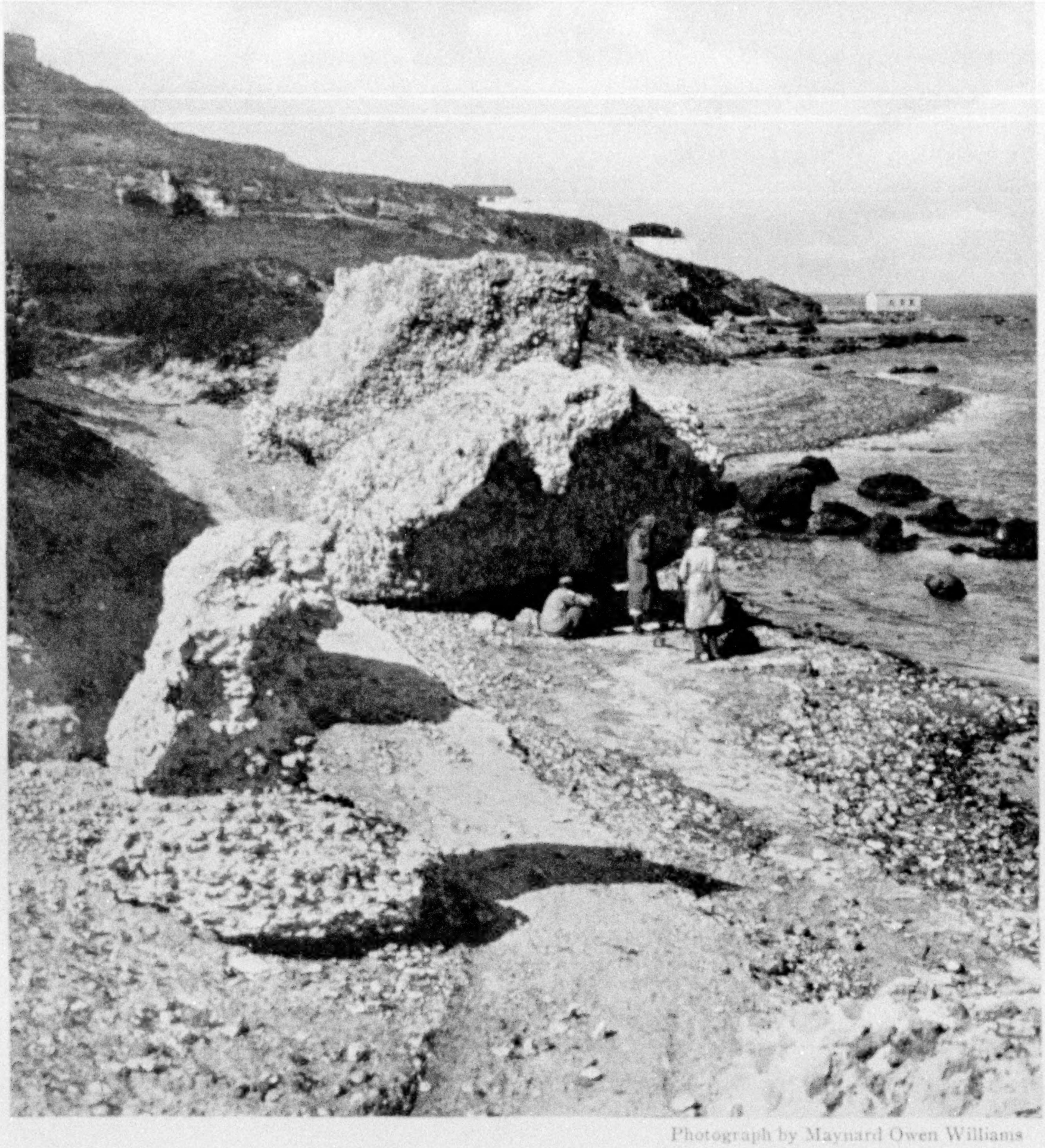
The foreground is a cement surface for catching rain water, probably much the same sort of rain-catcher that was used in ancient Carthage before Hadrian completed the Zaghouan Aqueduct. According to Moslem tradition, Saint Louis (Louis IX of France) before his death embraced Islamism and took the name of Bou Saïd.



Photographs by Maynard Owen Williams

CISTERNS OF LA MALGA, PROBABLY DATING FROM THE PUNIC PERIOD

These cisterns, open to the sky, were at first used for rain water, but when Hadrian built the 80-mile aqueduct from Zaghouan they served the Romans as storage tanks. Now they are used as storehouses and dwellings by the miserable inhabitants of the village.



Photograph by Maynard Owen Williams

THE BATHS OF ANTONINUS

Looking north along the seashore. In the upper left corner is seen a part of an old fort on Bordj el-Djedid, a hill where many tombs have been brought to light by excavators.

Phœnician seaport; so the Carthaginian people held their section of what is now Tunis as far back as their African history has been revealed.

ONCE A CITY OF A MILLION PEOPLE

Under the Barcas family (Hasdrubal, Hamilcar, Hannibal, etc.) Carthage was a great center of wealth and commerce, with a population which has been estimated variously between 700,000 and 1,000,000.

A good impression of what the city may have been in Hamilcar's day is obtainable from that greatest of French historical novels, "Salammbô," by Flaubert. Its immense palaces and temples in astonishing number were the envy of other nations, and a great triple wall was built to protect the city on the land side. It was from 50 to 60 feet high and more than 30 feet thick, with casements at the ground level for 300 elephants, and above these stalls for 4,000 horses, vast storage space for food and supplies, and quarters for 24,000 men.

Photograph from Byron de Prorok

VISITORS AND EXCAVATORS AT THE UNCOVERING OF THE GRAND MOSAIC OF THE BATHS OF GARGILIUS (SEE ALSO PAGE 406 AND TEXT, PAGE 408)

On the lower level, from left to right, are Fred Singer, attaché of the American Embassy at Paris; Princess de Cystria, Countess de Prorok, Mrs. Singer, Count de Prorok, Prince de Cystria, and Père Delattre.

The buildings of Carthage prior to its destruction by the Romans, in 146 B. C., were in some cases seven stories high.

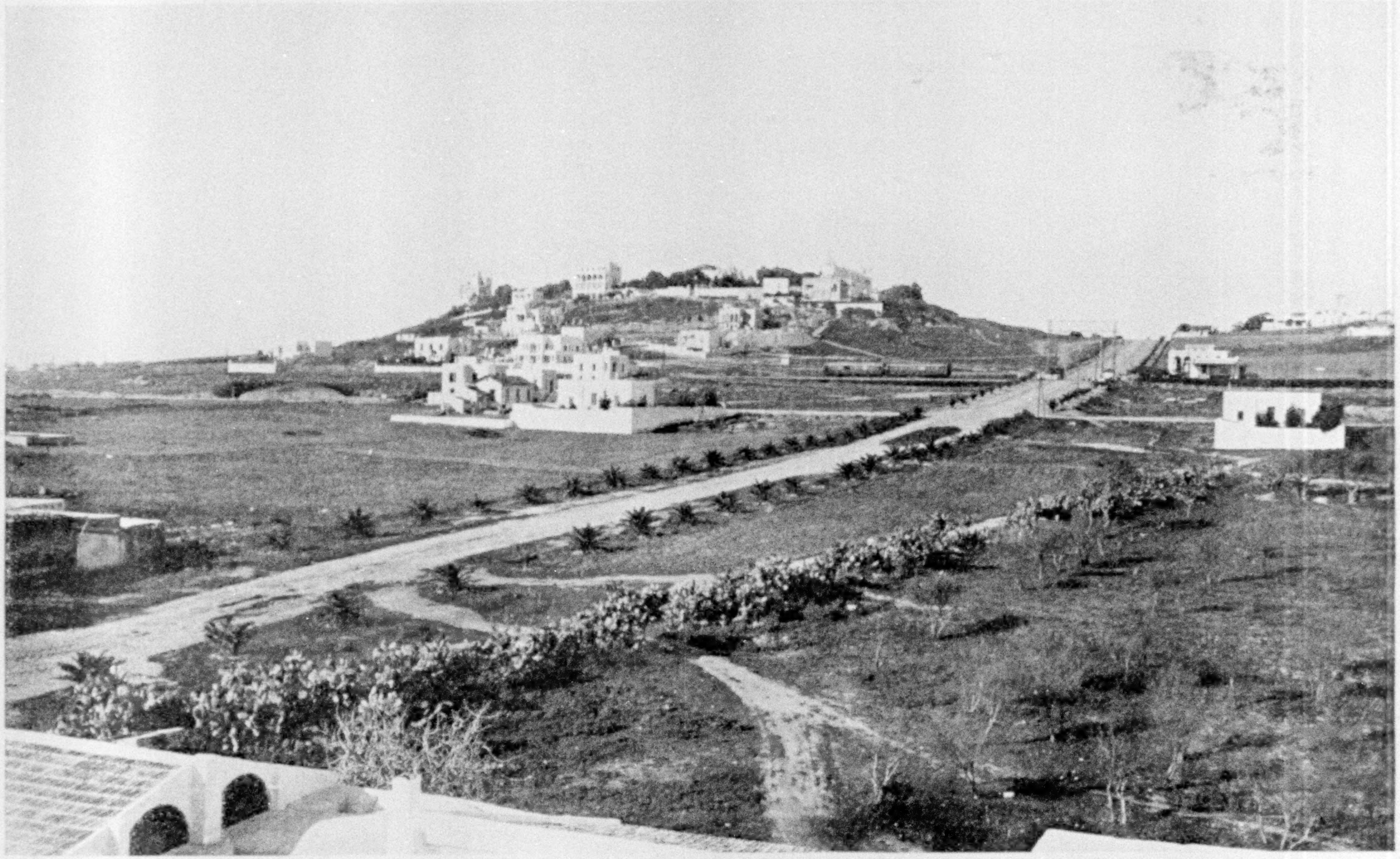
From the accounts of Cato the Elder, the implacable foe of the city, whose "Delenda est Carthago" is unforgettable, the construction of the city must have been of admirable soundness—in fact, such that the conflagration of sixteen days can scarcely have demolished entirely the gigantic edifices and strong foundations. Part of these we expect to find intact at a great excavated depth.

CARTHAGE WAS NOT COMPLETELY DESTROYED

The utter devastation and obliteration of Carthage which for centuries following the Punic wars were thought to have taken place have been recently contradicted by exploration. Over the ruins long untouched dirt and sand had drifted, but mercifully preserving innumerable objects of art which escaped destruction.

Twenty, forty, and sixty feet below the surface have been unearthed the vestiges of the Byzantine, Roman, and Phœnician occupations. In this work have been engaged the explorers Gauckler, Merlin, and Poinssot, of the Service des Antiquités, but the most notable efforts have been those of Père Delattre (see above), who, with exceedingly meager resources, has labored over the ruins for fifty years. He has discovered four of the earliest Christian basilicas, Roman and Punic necropolises, an amphitheater, and many priceless relics, but during this long period of arduous search he has actually explored only one-tenth of Roman and Christian Carthage.

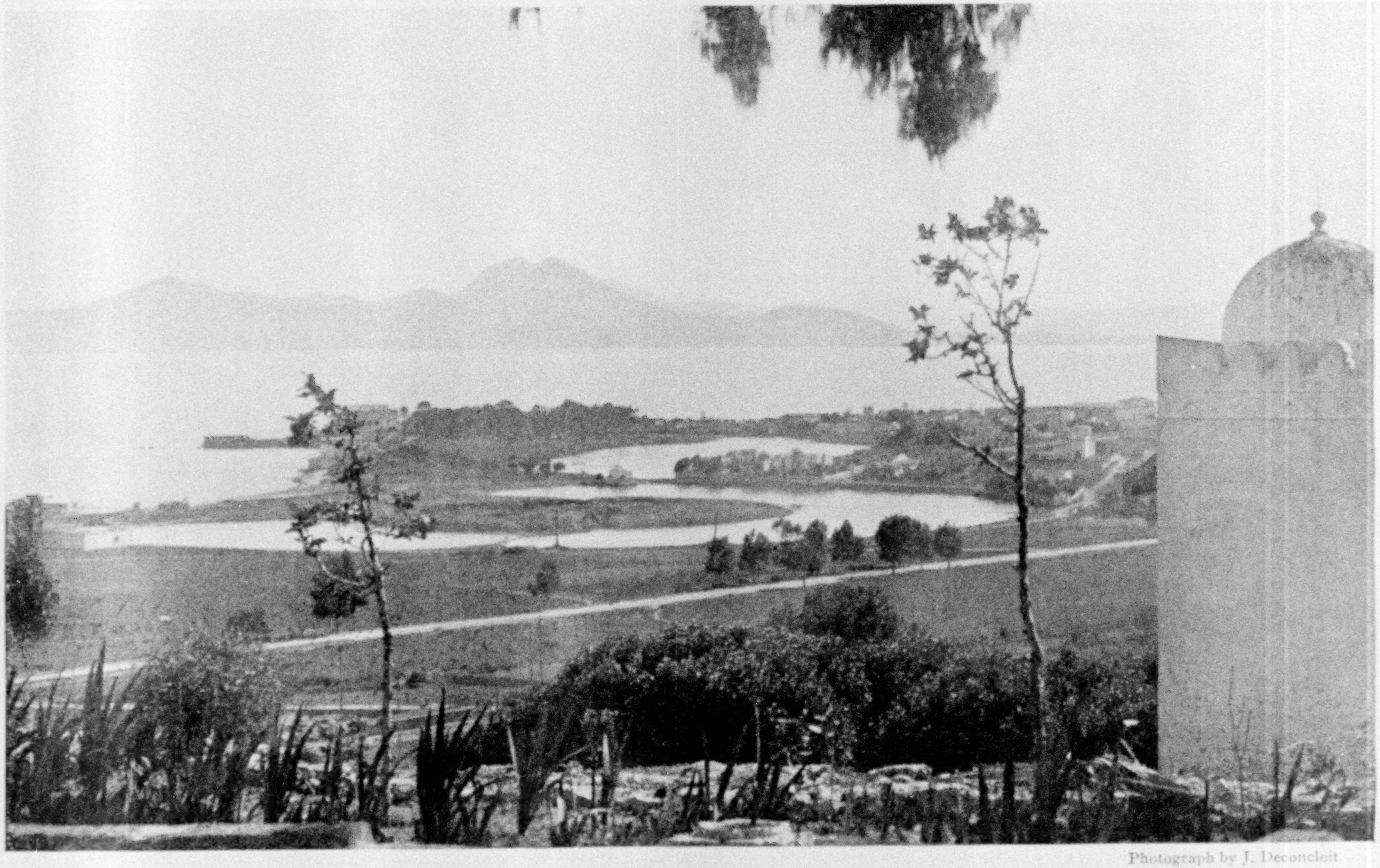
My own expedition has thus far more than justified the effort spent for four years. Remains previously located by Père Delattre have been completely excavated. Winter before last I continued the late Jules Renault's excavations, penetrated several strata and came across Arab tombs, a Christian chapel, Roman



Photograph by Soler, Tunis

THE BYRSA, OR CITADEL, AT CARTHAGE

Legend says that when Dido landed here she bargained with the natives for as much land as might be inclosed by the hide of a bull. The sale having been made, she ordered the hide cut into the thinnest strips possible and with these surrounded a site upon which she erected a citadel, calling it the Byrsa (from a Greek word meaning the hide of a bull). Modern buildings and villas on the site of Carthage are a source of great distress to the archeologists, who long to delve beneath all this area.



Photograph by J. Deconcloit

THE NAVAL AND COMMERCIAL PORTS FROM THE HEIGHTS OF THE BYRSA

Across the inner curve of the Gulf of Tunis is Bou-Kornein, the sacred mountain where stood the Carthaginian temple dedicated to Baal (see text, page 391).

Photograph by Maynard Owen Williams

ONE OF THE BOYS WHO HERD GOATS AND CATTLE ON THE HILLS AROUND THE BASILICA OF SAINT CYPRIAN (SEE ALSO PAGE 403)

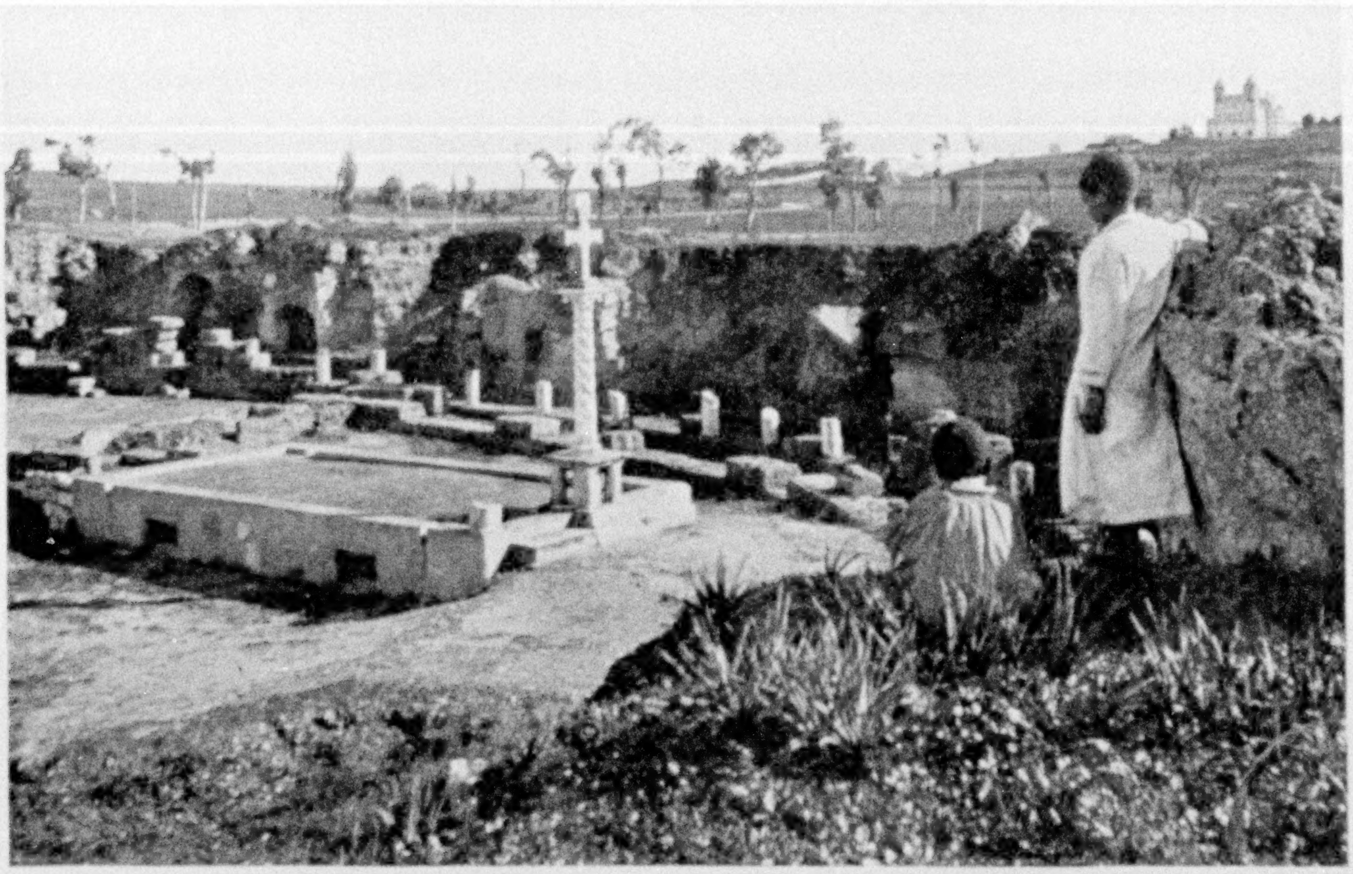
cisterns, Byzantine relics of variety, marvelous mosaic floors, and beneath them Punic tombs of 700 B. C.

A TEMPLE WHERE CHILDREN WERE BURNED ALIVE

All the earth dug up at Carthage is carted away and passed through sieves. As laborious as this latter process is, it has been rewarded by the recovery of many coins, crystals, emeralds, beads, etc.

The most sensational discovery lately was the Temple of Tanit by the amateur archeologist, M. Icart (see pages 408 and 409), where human sacrifices were offered by the Carthaginians to the goddess of that name and to Baal Ammon. Literally hundreds of urns were found containing the bones of children from four to twelve years of age who had been burned alive.

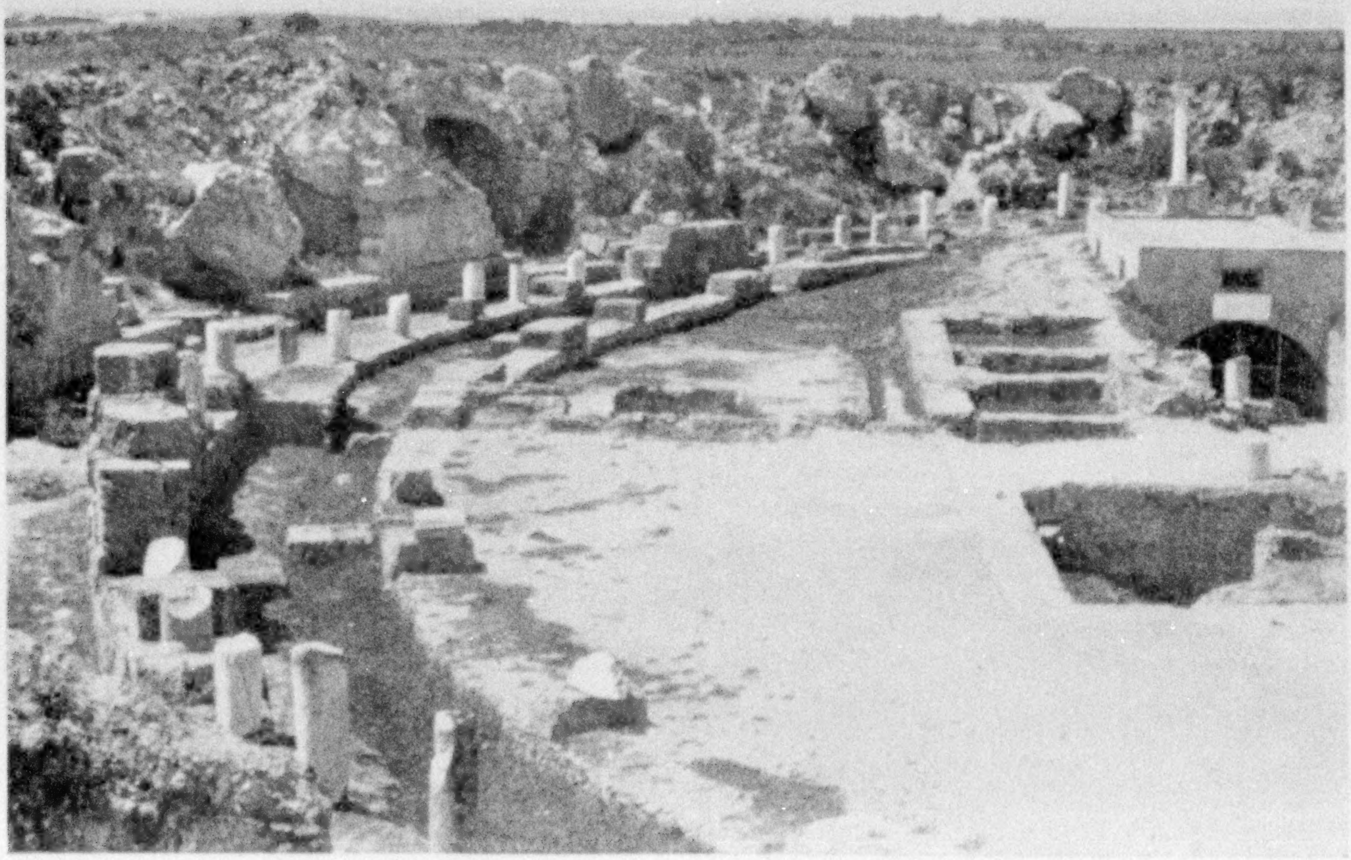
The clew which led to this important climax of our efforts was supplied by an Arab, who was seen digging for stone inscriptions near the location of the Punic ports (see illustrations, pages 392 and 402) for the purpose of selling them to tourists. We undertook operations near by and found inscriptions to the deities



Photograph by J. Deconcloit

THE MARBLE CROSS ERECTED BY CARDINAL LAVIGERIE IN THE ROMAN AMPHITHEATER

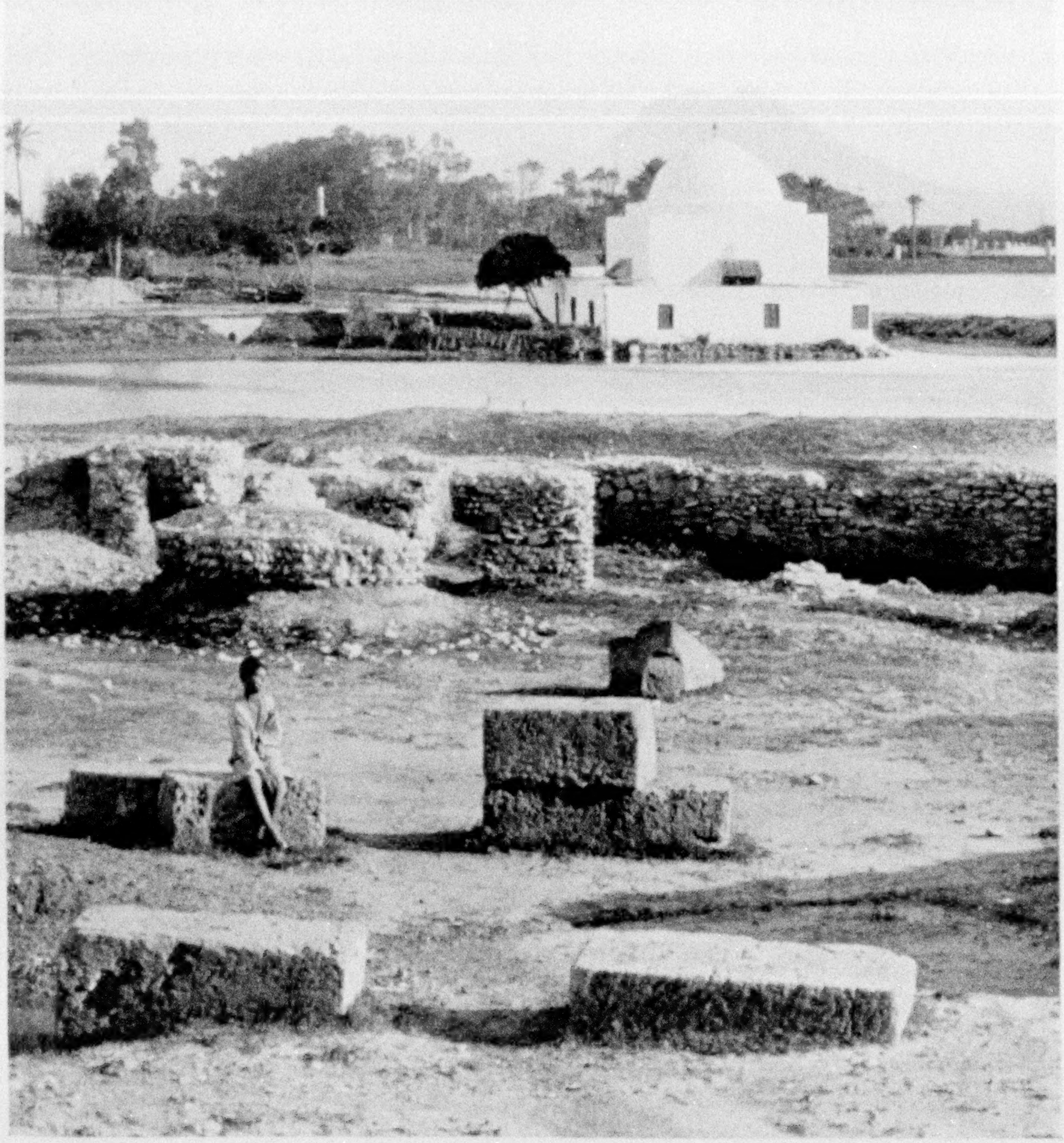
It is sacred to the memory of Saints Perpetua and Felicitas (see below). In the distance is the Cathedral of Saint Louis on the Byrsa.



Photograph by Maynard Owen Williams

RUINS OF THE ROMAN AMPHITHEATER AT CARTHAGE

This arena, almost as large as the Colosseum at Rome, was used for wild-animal exhibitions and other brutal spectacles, and it was here that Saint Perpetua and many of her companions were torn to pieces by lions under Septimius Severus, in 203 A. D. In the center of this pagan amusement place is a chapel commemorating the early Christian martyrs (see above).



Photograph by Maynard Owen Williams

LOOKING SOUTH FROM THE RUINS OF THE PUNIC ADMIRALTY

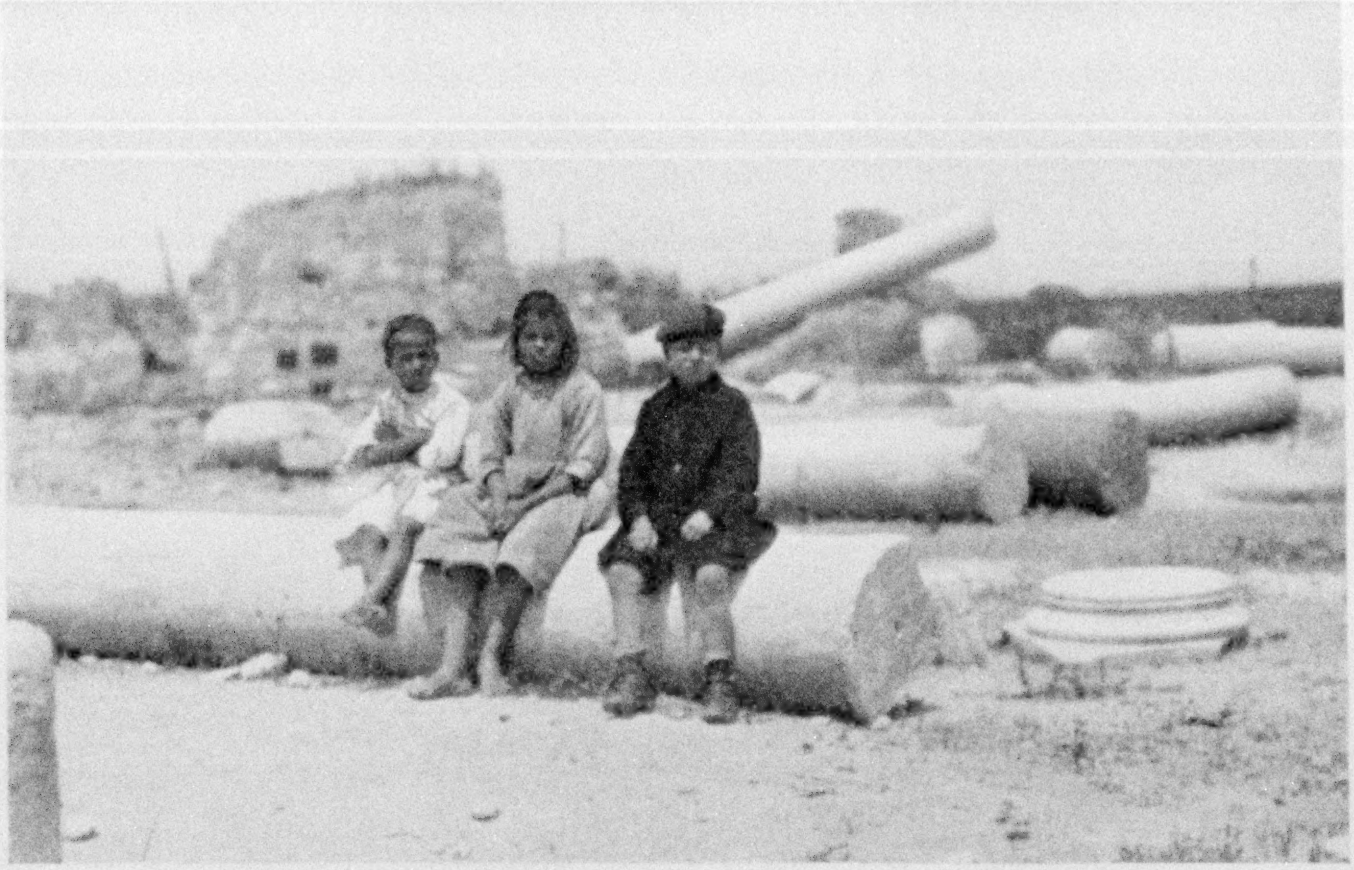
The white-domed marabout (tomb) stands near the place where the circular naval harbor, the remnants of which are seen in the foreground, was joined to the commercial harbor, whose waters can be seen beyond. There is little question that these walls are Punic work, dating from the time when Carthage was the cruel mistress of the seas, maintaining the Phœnician tradition for close dealings.

mentioned and a large field of stiles bearing the pagan symbol of fertility, a crescent reversed over a disk or triangle.

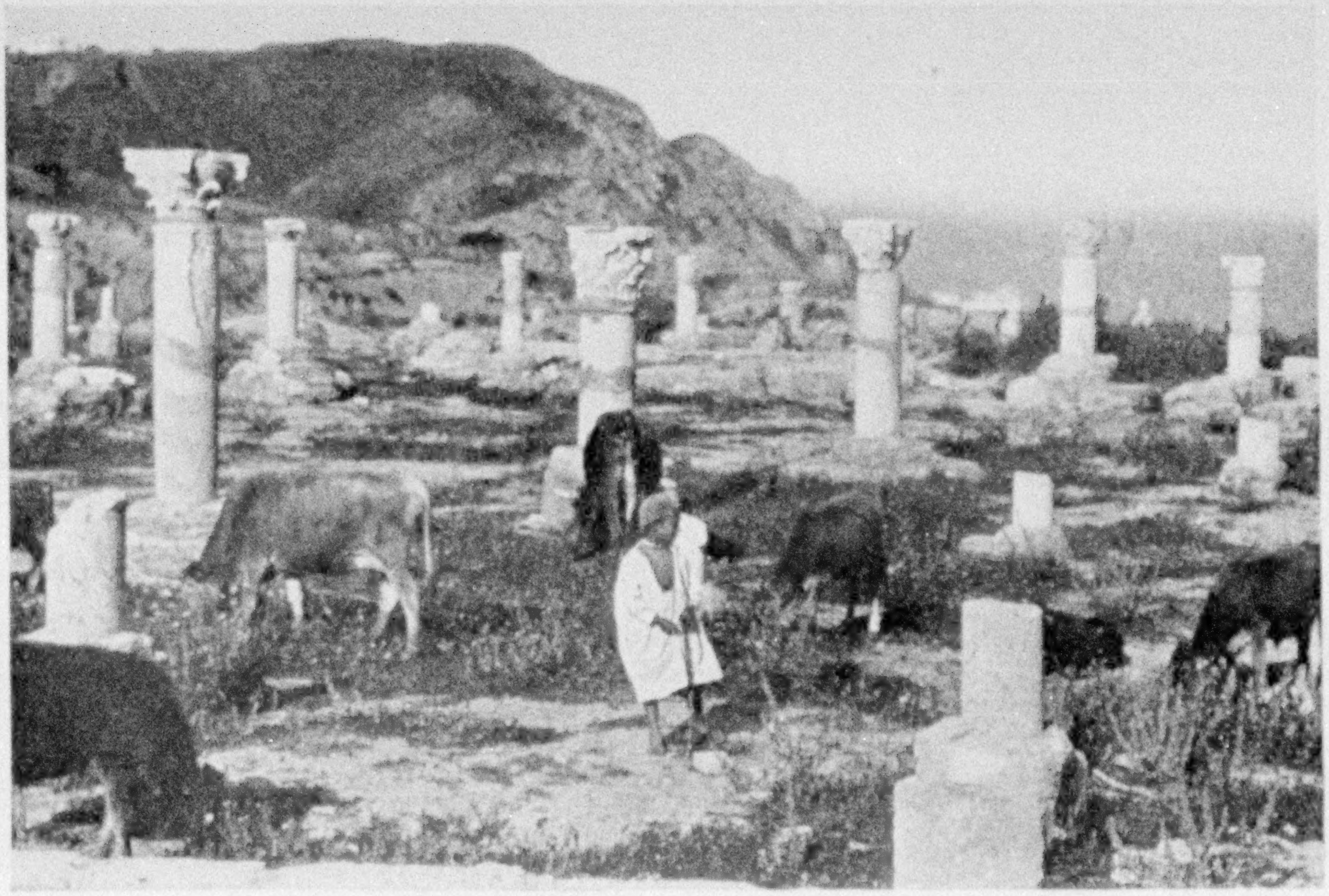
Below this site were the urns, which were about twelve inches high, of red or white terra cotta, with handles and wide mouths sealed with yellow clay. Besides the bones of children were those of lambs and birds here and there. The name of the child sacrificed appeared on the stile immediately above.

Small wonder that the prophets of Israel spared no invective against Baal! Altars, pillars, and capitals with Phœnician carving were also found, and again appeared the crescent and triangle of Tanit, the bull head or a crude replica of the goddess.

I am hopeful of finding the statue of Baal Moloch in this sanctuary—that terrible idol into whose flaming interior were thrown so many Carthaginian children by



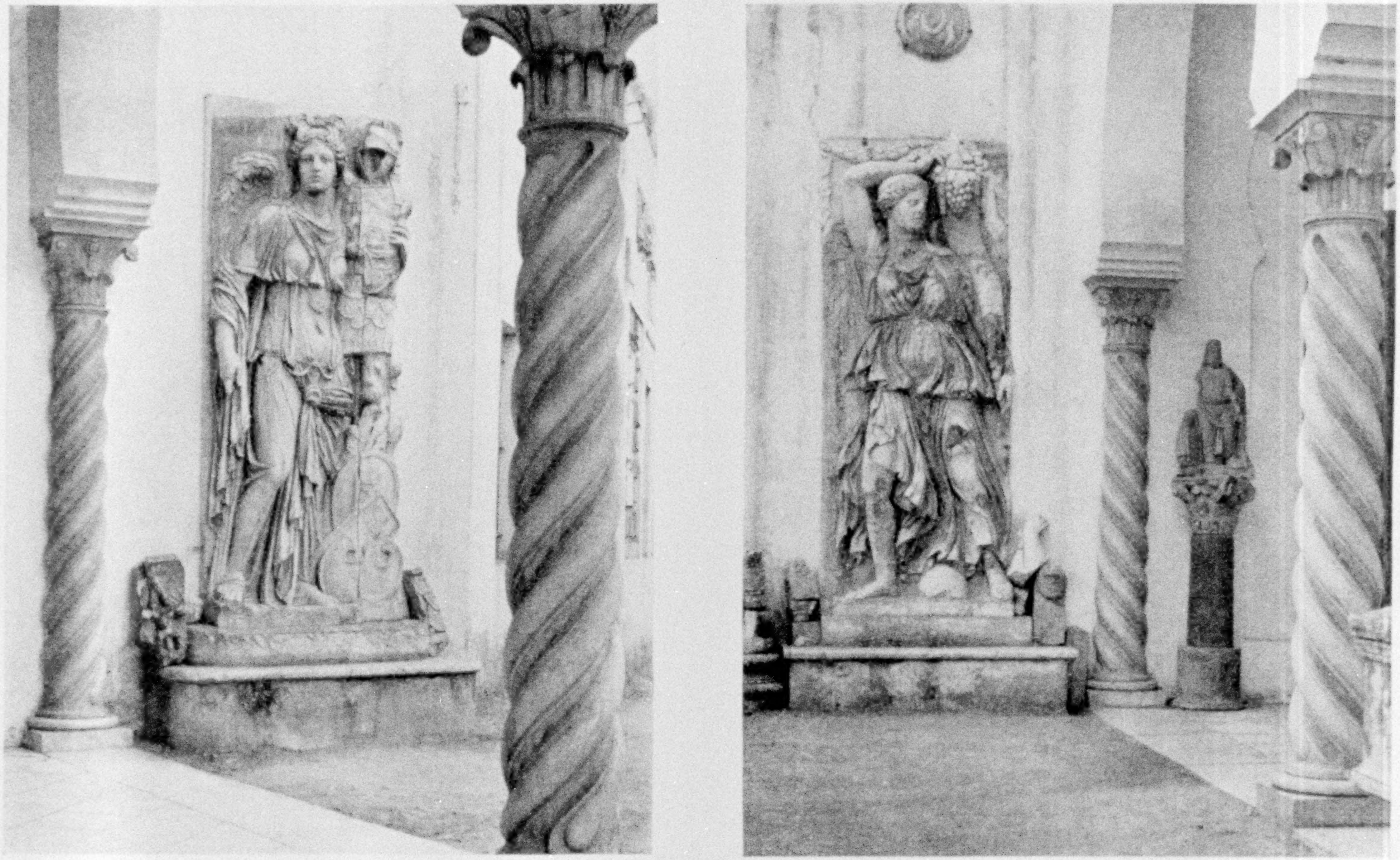
SOME OF THE COLUMNS OF A TEMPLE RECENTLY EXCAVATED BY THE SERVICE DES ANTIQUITÉS AND NOT YET IDENTIFIED



Photographs by Maynard Owen Williams

THE BASILICA OF SAINT CYPRIAN (SEE TEXT, PAGE 409)

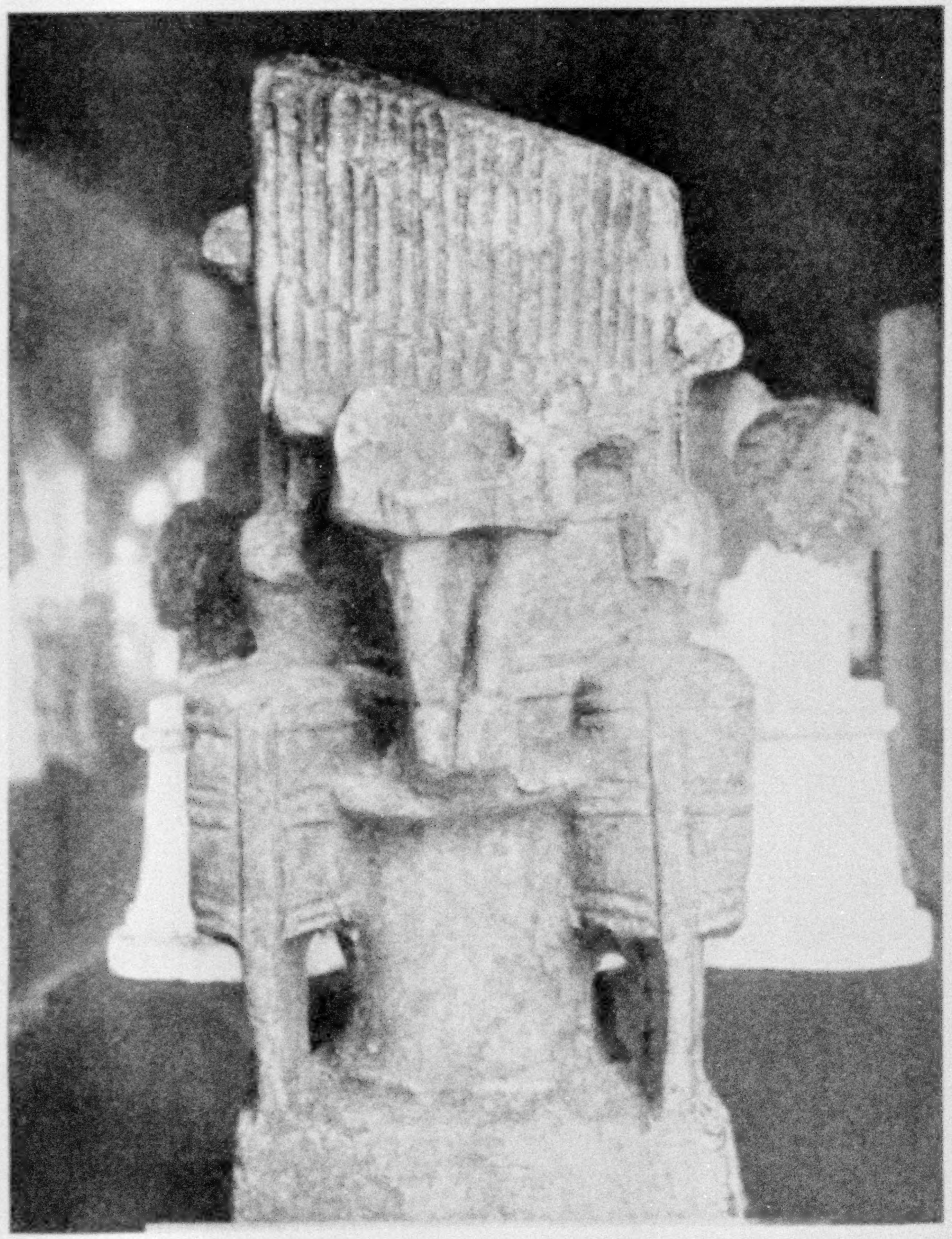
View to northeast, with the red hill on which Sidi-bou-Saïd rests, like a white dove, to the left. This large church, dating from the fourth or fifth century, was surrounded by graves, from whose inscriptions much has been learned about the history of Carthage after the Roman occupation. The boy with his cattle is a fair type of the children who roam over the site of the old city and live in cisterns, mud hovels, and pits (see page 395).



Photographs by Maynard Owen Williams

VICTORY (LEFT), FOUND IN 1894 ON THE BYRSA, AND ABUNDANCE (RIGHT), RECONSTRUCTED FROM 250 FRAGMENTS

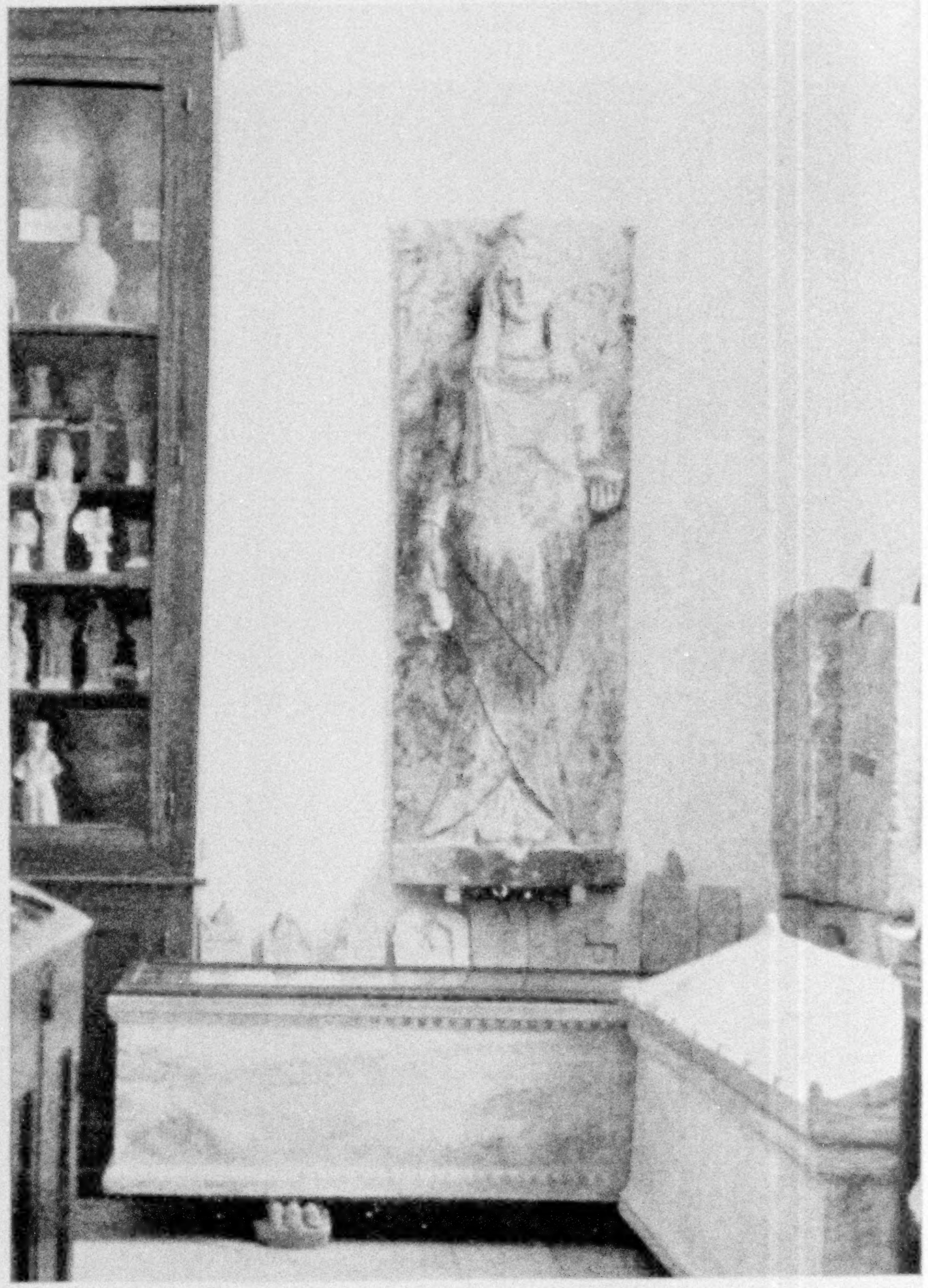
The sculptures are Roman. On the small column pedestal under the portico to the right of Abundance is a small statue of Æsculapius and the little god Telesphore. This small statue illustrates the perplexities and joys of the archeologist. Several years after the body of the statue was found Père Delattre was conducting a professor from Algiers around the Necropolis on the hill of Saint Monica, probably a mile away from the Byrsa, where the body was found. His workmen were just then unearthing a marble head. The savant at once suggested that it seemed to belong to the body found years before. The whole party started for the museum, hoping to see the reunion of torso and head, but when the two were brought into close relation it seemed that the head was too large for the body. Père Delattre then fitted the head on to the body, and so perfect was the union that one could scarcely see the point of junction. A part of the arm was found at the same time and in the same place.



Photograph from Byron de Prorok

REPLICA OF AN ORGAN DATING FROM 100 A. D., DISCOVERED BY PÈRE DELATTRE

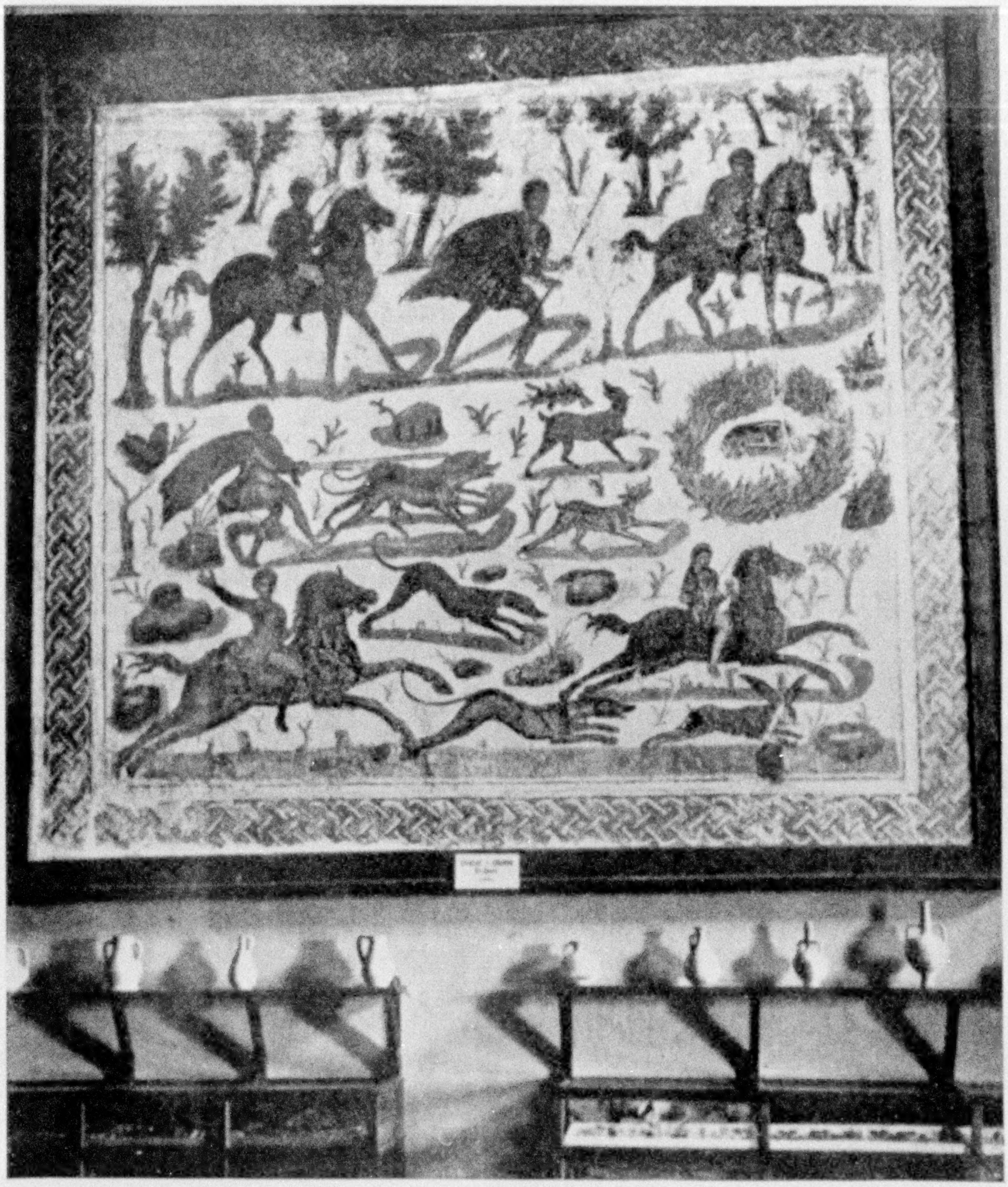
This is one of the most remarkable pieces of statuary unearthed at Carthage. Note the feet of the musician and the organ bellows to the right and left.



Photograph by Maynard Owen Williams

THE PRIESTESS ARISATBAAL, THE FINEST EXAMPLE OF PUNIC ART EXTANT

This statue is the cover of the marble sarcophagus seen below it, in which there are still the remains of this lovely woman of the days when Tanit and Baal were worshiped (see page 400).



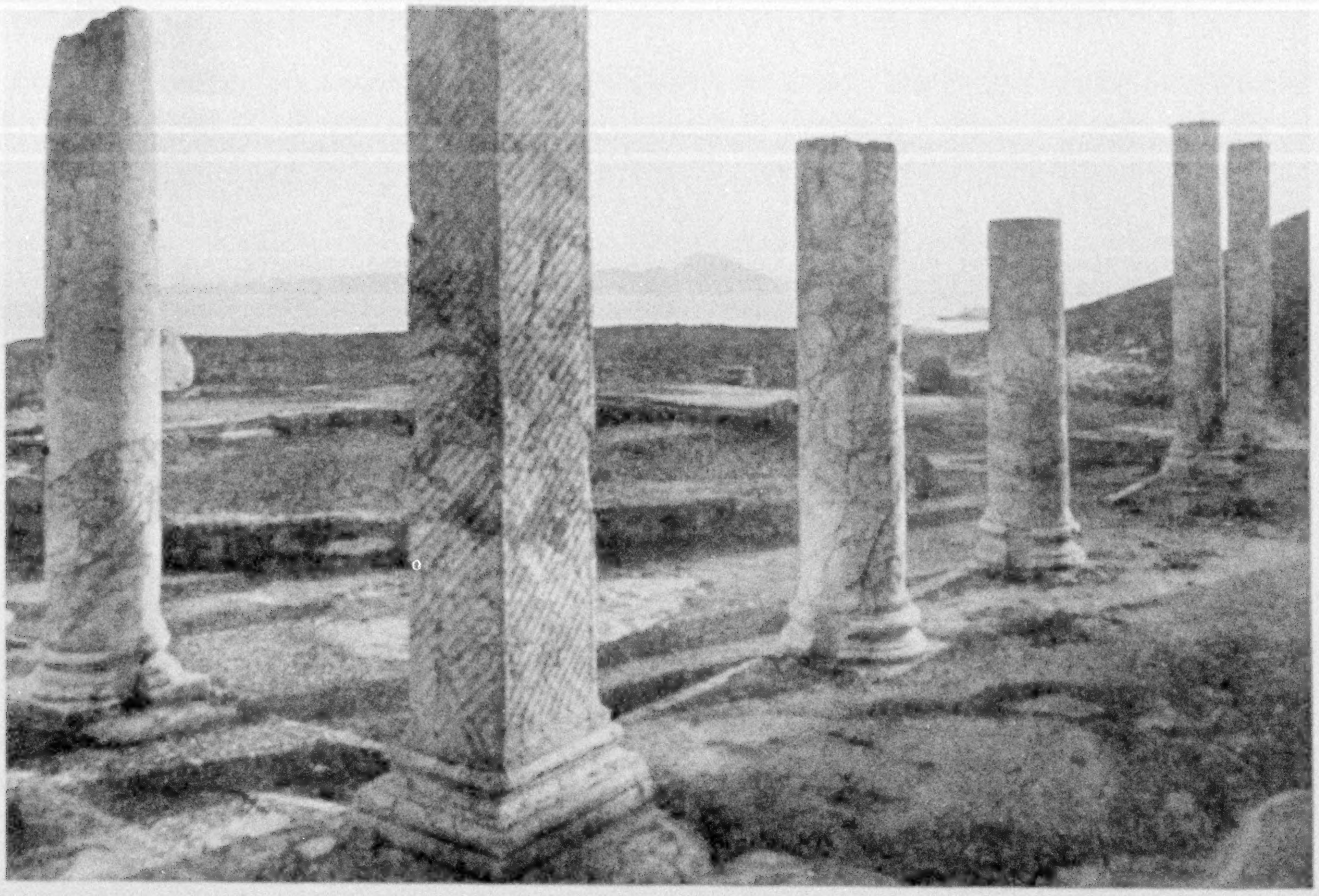
Photograph from Byron de Prorok

AN EXAMPLE OF MOSAIC FLOOR FOUND IN TUNISIA BY THE SERVICE DES ANTIQUITÉS (SEE ALSO PAGE 397)

their own mothers. This work of excavation is now in progress.

The altars unearthed at the lowest level were undoubtedly of Egyptian origin. Rectangular silver tablets engraved with squatting sphinxes, and amulets of bluish stone representing the eye of Osiris and covered with Egyptian hieroglyphics conclusively demonstrated the one-time influence and probable presence of that race. There is ground for the belief that Baal Ammon was originally the Ammon Ra of the Egyptians.

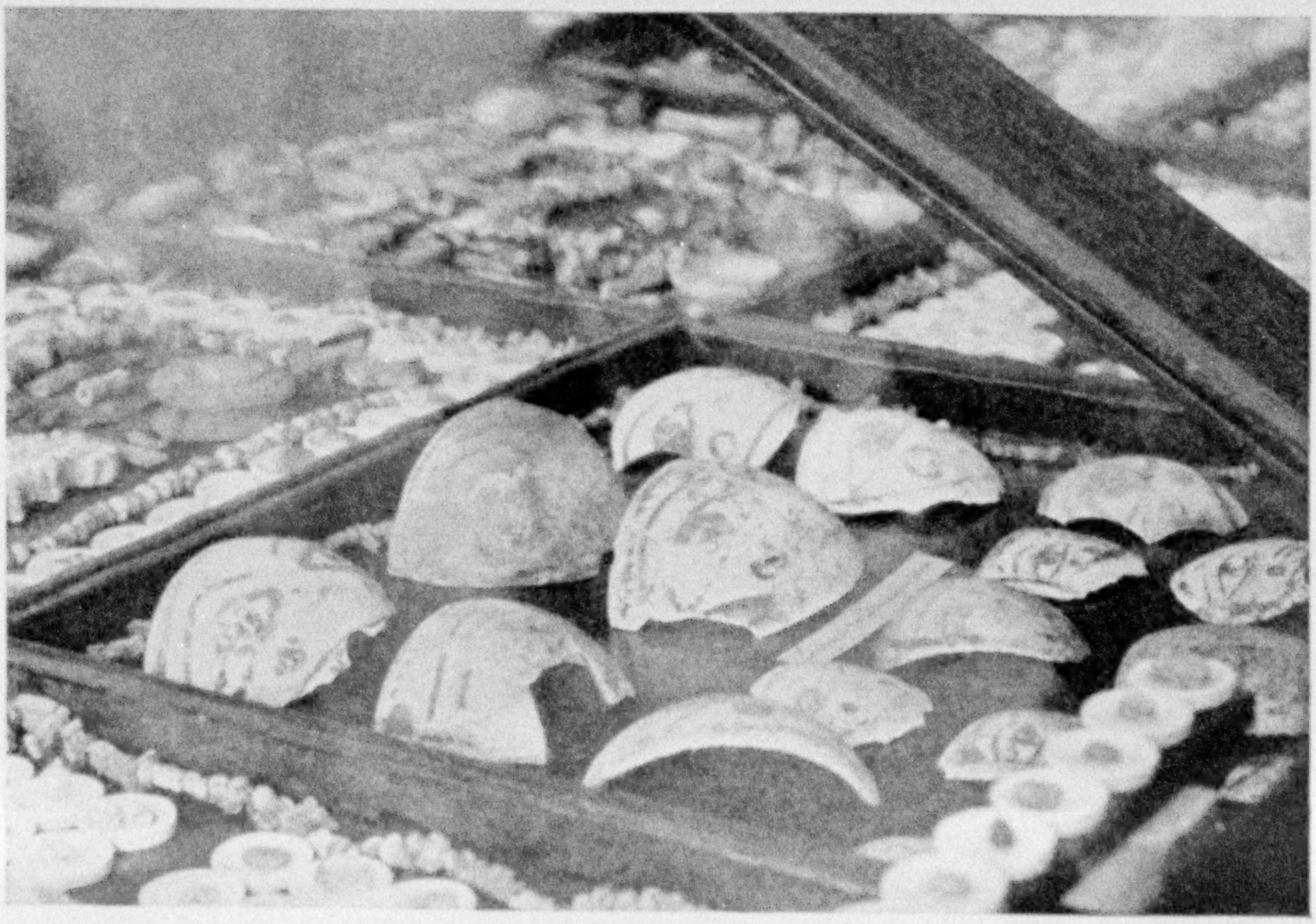
New light may be shed on the mysterious rites of the early Carthaginians, as the excavations proceed. The votive tablets we have discovered are invariably inscribed in the following form: "To the divinity Tanit, Face of Baal, and to the Lord Baal Ammon, a votive offering



Photograph by J. Deconcloit

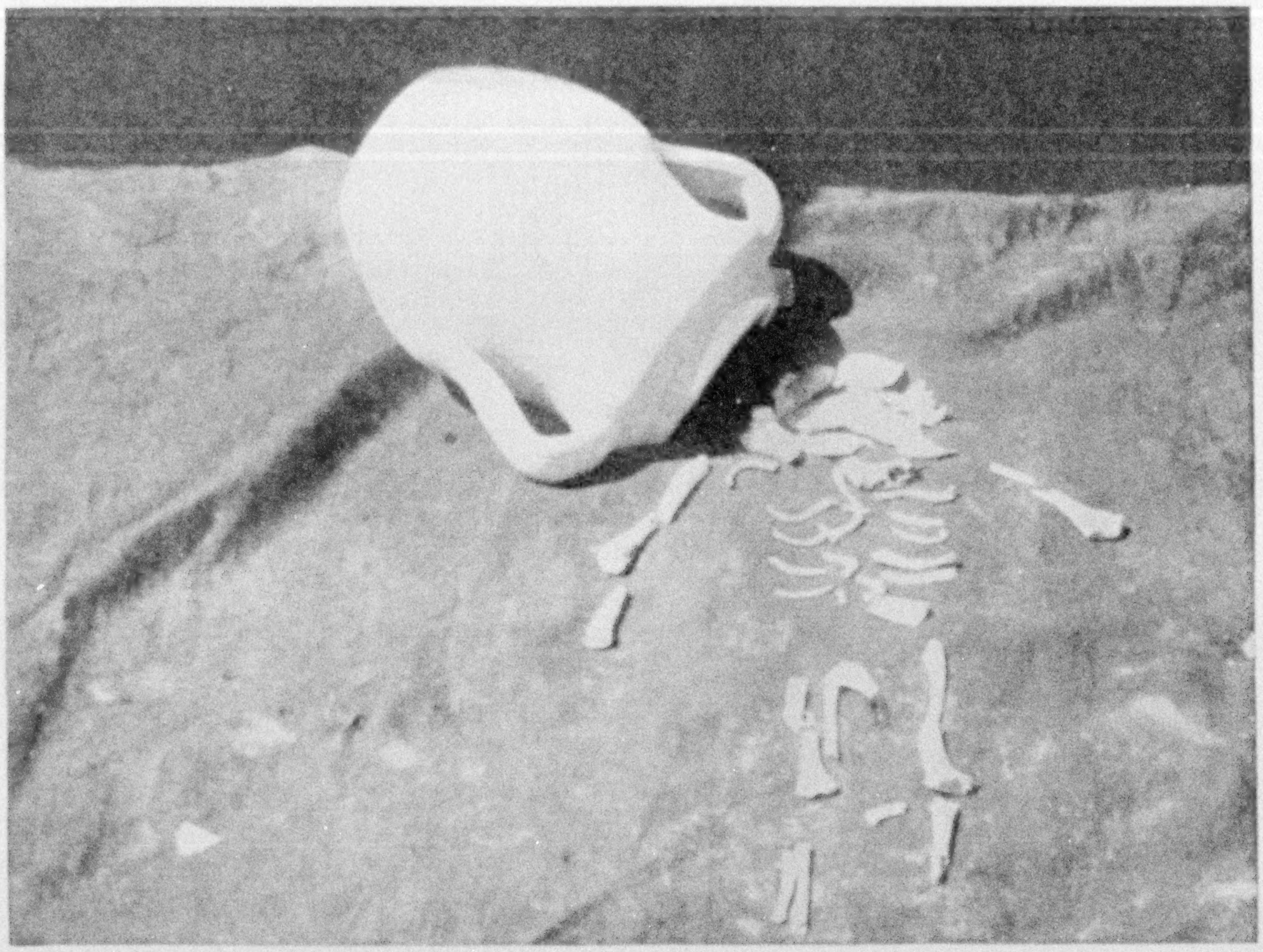
THE SITE OF ONE OF THE OLD VILLAS OVERLOOKING THE SEA BELOW SIDI-BOU-SAÏD

In the distance looms the crescent peak of Bou-Kornein (see also page 399).



Photograph by Maynard Owen Williams

DRAWINGS ON OSTRICH SHELLS FOUND IN CARTHAGE



Photograph from Byron de Prorok

AN URN CONTAINING BONES OF CHILDREN SACRIFICED TO TANIT AND MOLOCH

This grim reminder of the practice of human sacrifice by the Carthaginians was discovered in the Temple of Tanit last year (see text, pages 400 and 402).

made by Hasdrubal, son of Hanno, because he has heard the voice of the goddess, blessed be she."

BABIES SACRIFICED WHEN THE CITY WAS IN DANGER

The shocking ceremony of human sacrifice was especially resorted to when Carthage was in great danger from her enemies. Hundreds of children of the noblest families were offered up to placate the rage of the hideous god Baal, whose horned and bull-headed image stood in the temple in constant readiness to receive his living food. The arms of the idol were raised by pulleys, and amid the clashing of cymbals, the beating of drums, and a fanfare of musical instruments the sacrifices were dropped into the burning interior.

Fascinating results of a different character were found in our excavations north of the Acropolis on the Hill of Juno. Above the surface of poppy fields appeared a mound of bricks, and setting to work we disclosed the roof of a Roman palace; then seven perfect mosaic floors of the first Roman period (see pages 397 and 406).

There were hundreds of broken stones bearing inscriptions, fragments of statues, and a complete collection of African lamps of the period from 100 to 300 A. D.

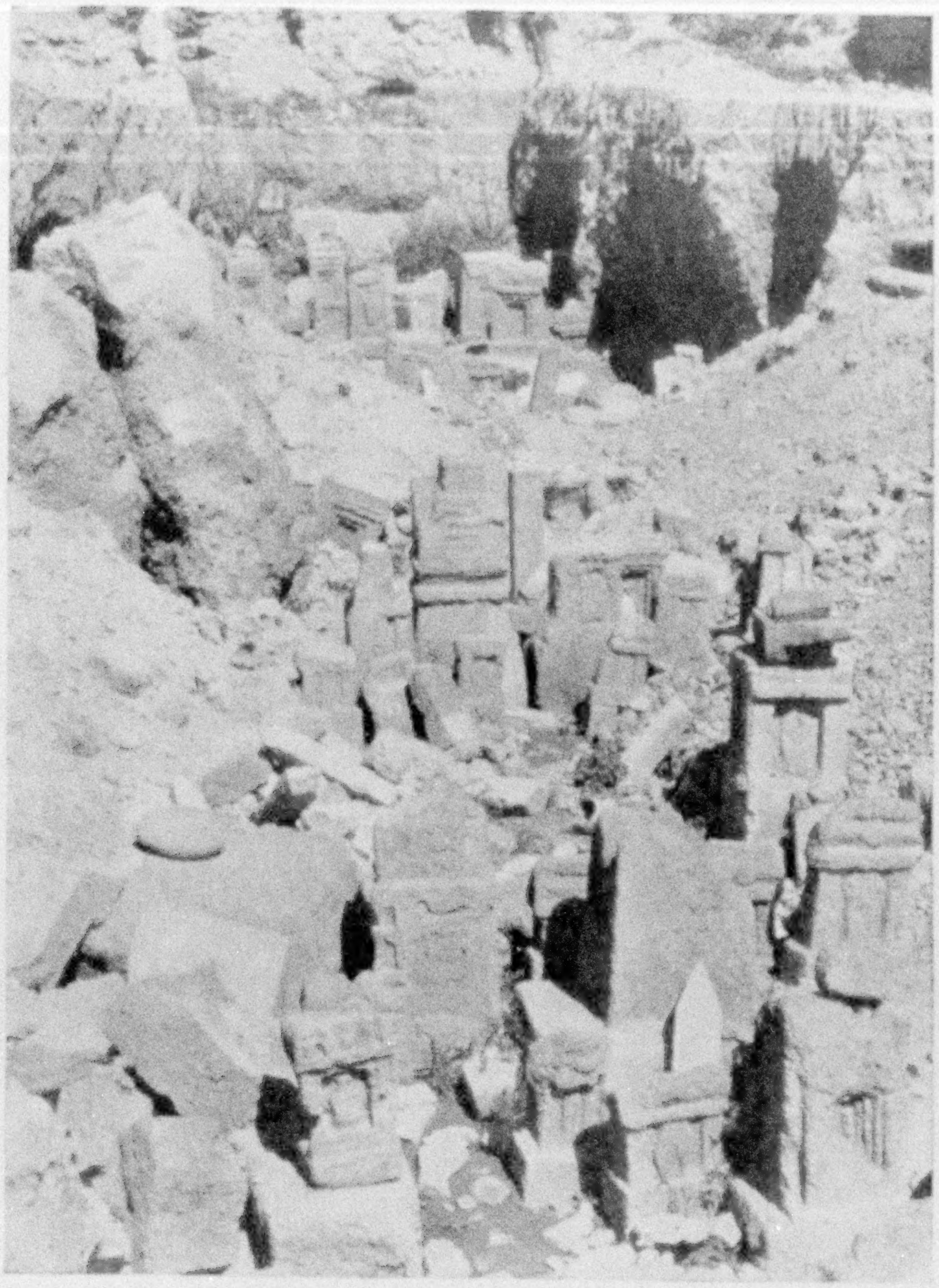
Of especial significance was the discovery beneath the mosaic floors of a Punic ruin, which led us thirty yards under the hillside and established beyond any dispute that the Carthage of old had not been totally obliterated.

Some of the ruins on the Hill of Juno are very probably the remains of the famous baths of Gargilius, where the council of 565 bishops met in 411 A. D. to determine whether Christianity was to remain Catholic or become Donatist. In a vaulted chamber near by, which might have been the boudoir of a Carthaginian lady, were found perfume bottles, bracelets of gold, ivory hairpins, bronze mirrors, nail scissors, ivory eyebrow sticks, and much iridescent glass (see page 413).

In the Roman cisterns were revealed new wonders; an early Christian basilica with the tombs of martyrs and Christian inscriptions, many fine Byzantine relics, and seven statuettes of the Virgin Mary in terra cotta were also revealed. As in the case of many of the chapels, this had doubtless been built in secrecy to escape the persecutions of the second century.

Twelve basilicas have been located, all told, though only three have thus far been properly excavated. The basilicas of St. Cyprian (see page 400) and Damous el-Karita (page 410) are two of the purest examples of Christian sanctuaries known.

Hundreds of tombs of martyrs lie between our former headquarters and the amphitheater to the north of the city (see page 401). An inspection of the coffins frequently revealed three nails, indicating that the victim had been crucified.



Photograph by Maynard Owen Williams

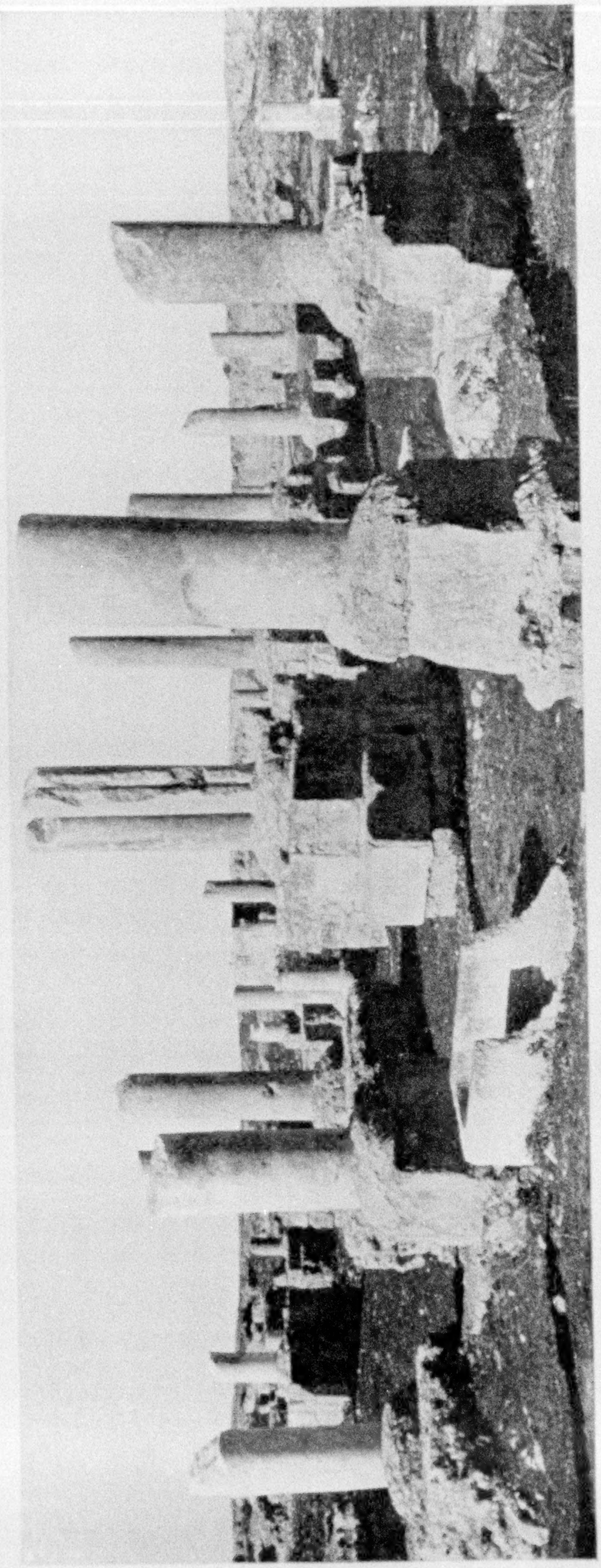
THE TEMPLE OF TANIT

It was in this temple, recently discovered by an amateur archeologist, that Carthaginians offered human sacrifices to the goddess Tanit and to Baal Ammon (see text, page 400).

ROUGE POTS, SPECTACLES, BRONZE RAZORS, AND BABIES' MILK BOTTLES FOUND

On the heights of Cape Carthage have been excavated by the Service des Antiquités ancient Punic tombs which had escaped the Roman conflagration, and these were buried, in many cases, thirty feet in solid rock. Mummies were found, beside which the personal adornments had been placed, jewels and trinkets in variety, inscriptions and sacred images, while at the entrance to the tombs grinning masks had been placed to frighten away evil spirits.

In four months we found 5,000 coins in gold, silver, and bronze and Roman remains, including also pottery, frescoes, bracelets, jewels, rings, and lamps. Vandal armor and strange lamps of barbaric shape recalled the inroads of the merciless followers of Genseric and Hunneric. The Museum of Carthage will rival in interest, it is believed, any of the world's great repositories for relics of the ancients. A pair of spectacles of the third century B. C., found in a Punic tomb, a terra-cotta figurine of an organ (page 405), pots of rouge and face powder, bronze



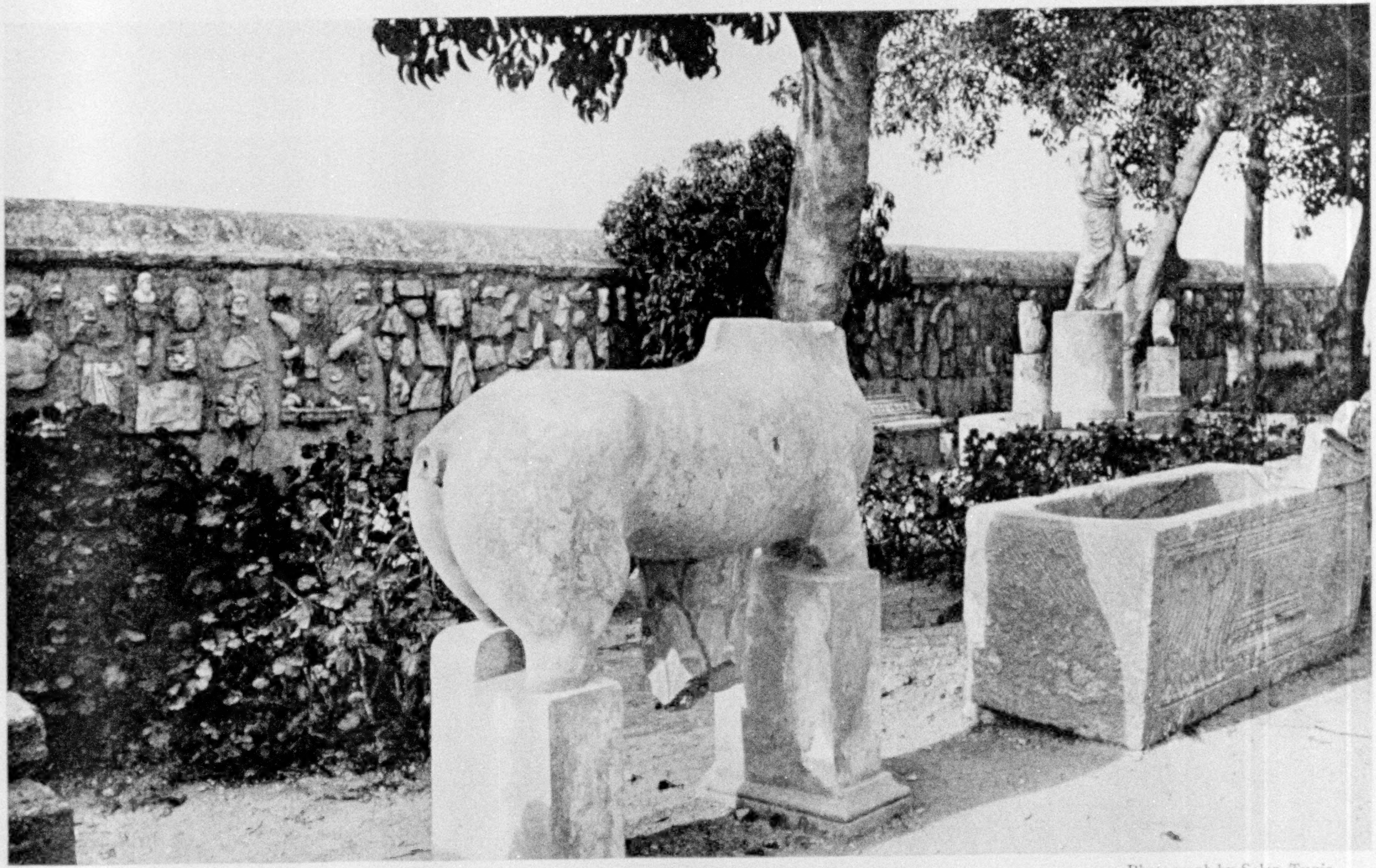
DAMOUS EL-KARITA, ONE OF THE MOST IMPORTANT DISCOVERIES OF PÈRE DELATTRE, THE LARGEST BASILICA THUS FAR UNEARTHED AT CARTHAGE

It was here that Père Delattre found 14,000 pieces of inscriptions from the tombs of the early Christians. A great many of these he has reconstructed, the most famous being those of the two patron saints of Carthage, Saint Perpetua and Saint Felicitas (see page 423).

razors and milk bottles (see page 413), found in the tombs of Carthaginian children, are also museum results of the researches of the great dean of French archeologists, Père Delattre.

Our historical, topographical, and archeological search indicates that the old Punic city did not occupy the site of Roman Carthage. On examination of the ground near Cape Kamart and the Sokra marshes I discovered traces which may lead to an impressive discovery, especially in the revelation of six ancient towers, which seem to have served as watch towers or lighthouses for the port. Strangely, these all apparently faced inward, toward the marshes, rather than seaward.

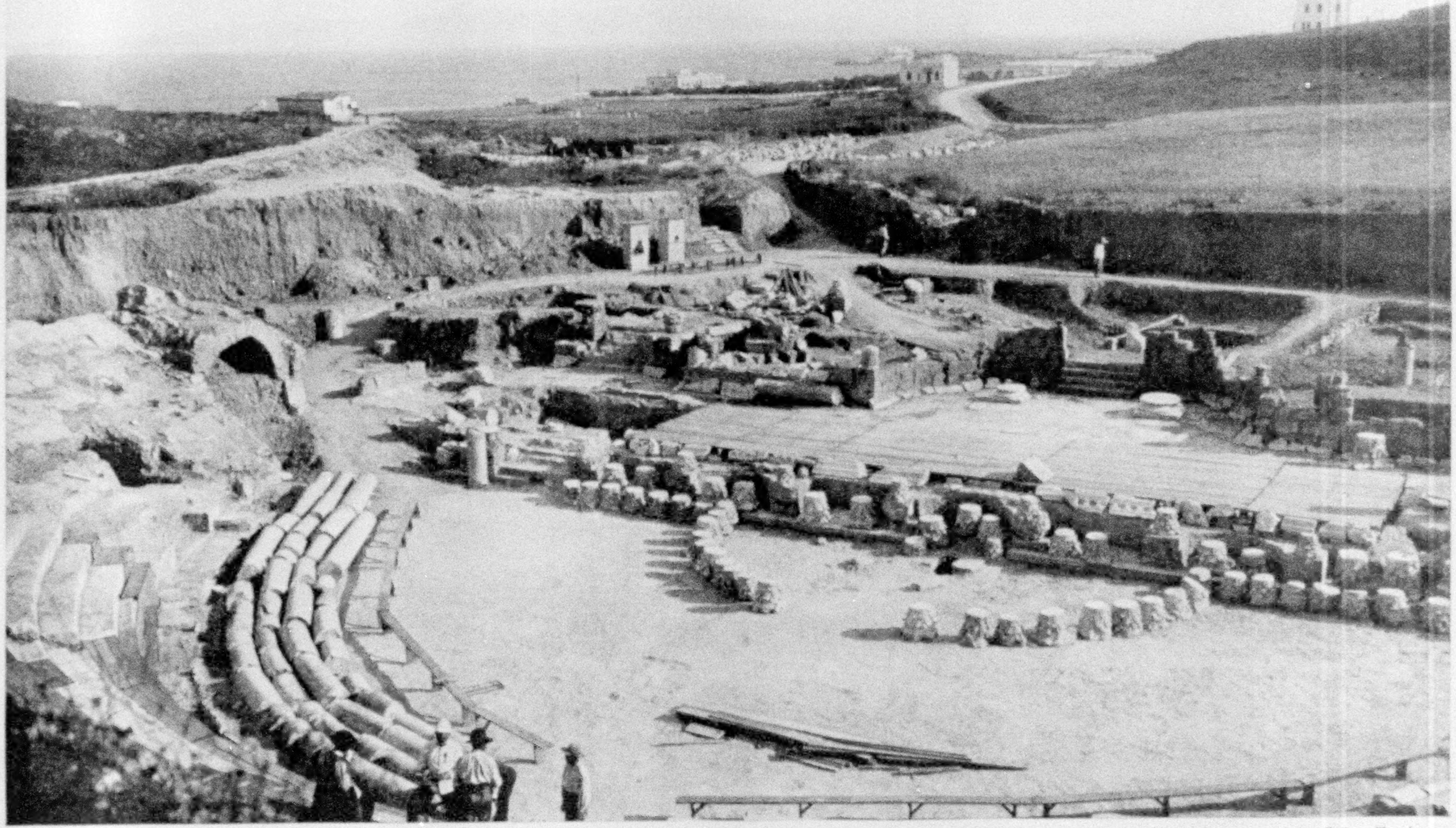
It may be surmised, however, that the towers, which are fifteen feet in diameter, may have served the double purpose of lighthouses and beacons by which the ships might find their respective moorings at night. Below their outlines I discovered the remains of a great wall, traceable intermittently for a mile and a half. It indicated a width of not less than fifteen feet, and continued examination may prove that it formed a part of



Photograph by Soler, Tunis

ENTRANCE TO THE LAVIGERIE MUSEUM

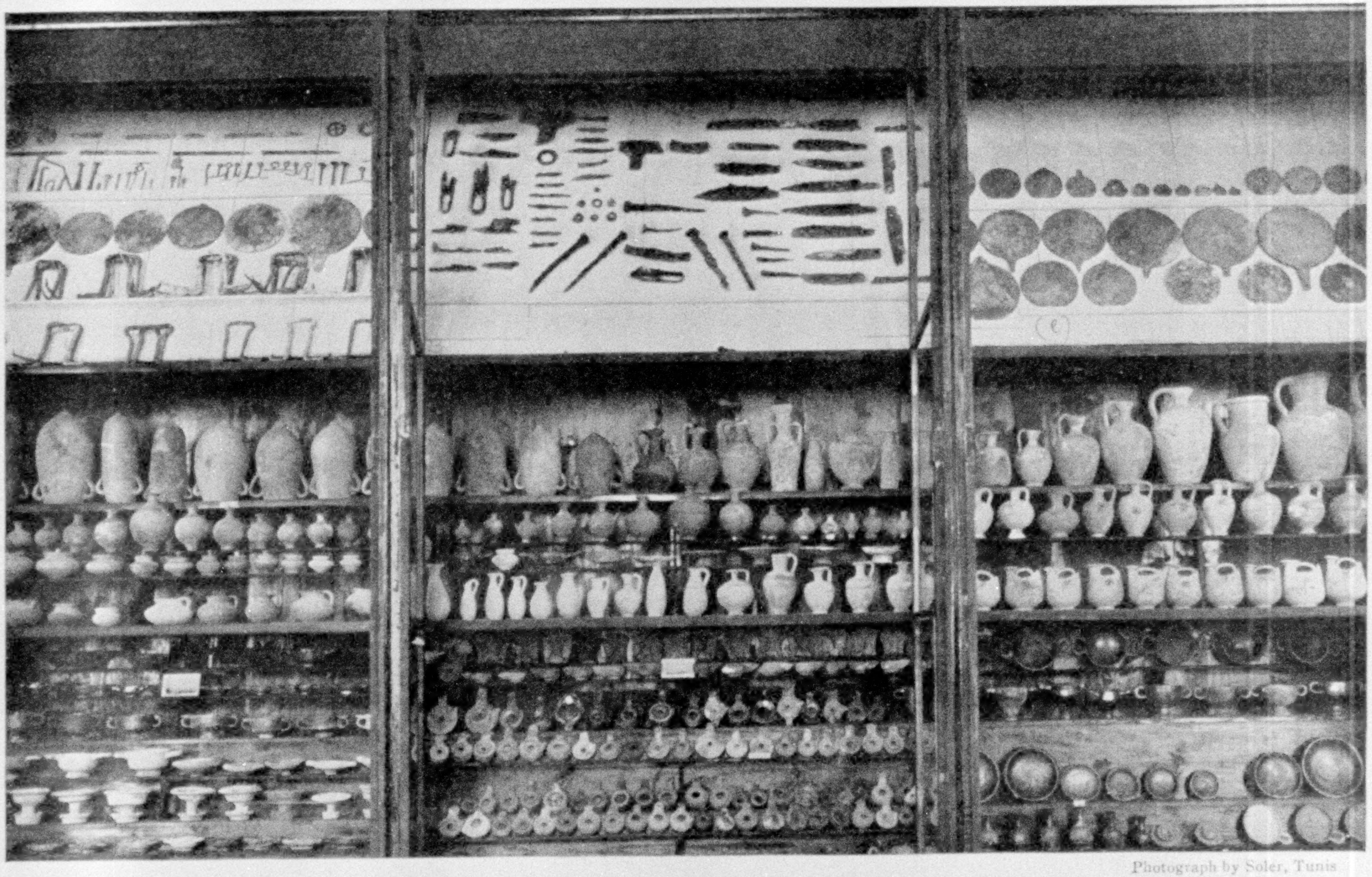
This trunk of a horse is considered one of the best bits in the garden of the White Fathers.



Photograph by Soler, Tunis

THE ROMAN THEATER AT CARTHAGE

This photograph was taken soon after excavation. Now the columns have been covered over or removed. In this great ruin the representation of Shakespeare's "Julius Cæsar" will be given for the first time in North Africa, on the anniversary of the poet's birth, this month (April 23, 1924). The performance has been arranged by Countess de Prorok, formerly Miss Alice Kenny, of New York. It will be followed by a visit of the Comédie Française, which will give a series of representations this spring—plays of Molière and Racine, especially the latter's "Britannicus" and "Andromaque." In the background is Bou-Kornein (see text, page 391).



Photograph by Soler, Tunis

IN THE MUSEUM OF CARTHAGE

Top, from left to right: (Case A) Surgical implements, razors, and Carthaginian ladies' bronze mirrors, some beautifully engraved, and iron clamps which held together the stones of the temples; (Case B) Roman, Carthaginian, Vandal, and Byzantine arms and scissors and rings used by the Carthaginian ladies; (Case C) Collection of beautiful bronze mirrors; (Case D) amphoræ (vases); (Case E) incense-burners from Carthaginian tombs, and a collection of Carthaginian, Roman, Byzantine, Vandal, Arab, Greek, and early Christian lamps; (Case F) babies' milk bottles.

the quays and landing stages of the great ports. It is of very ancient and massive construction.

Other interesting remains in the neighborhood were a succession of deeply sunken wells formed by huge masses of hewn rock. These were at a depth of fifty feet, and, upon descending into several of them, I observed that the slightly moving waters hinted at the existence of an underground stream. The wells are not marked on any of the published maps of the peninsula, where the shifting sands have covered up so generally the traces of the Punic city. Roman Carthage possessed no fresh-water wells—a fact which necessitated the construction, at vast expense, of one of the greatest aqueducts ever built by the Romans.

That the conquerors of the Carthaginians should have selected a slightly different location for rebuilding is suggested strongly by Scipio's interdiction: "Cursed are they, and doubly cursed are they who try to resurrect them." Another clew comes from Virgil in his description of Æneas' ascent of the hill which overhung the city, "whence he could see the opposite towers," and where, as Dryden translates him,

"The gates and streets; and hears from every part
The noise and busy concourse of the mart."

The location here indicated is plainly the hillside of Cape Kamart, which rose directly from the walls and ports. It would not have been possible to look down upon the town from any other part of the peninsula. The hill of Sidi-bou-Saïd (see page 395) is for many reasons not to be considered that to which Virgil referred.

SUBMARINE RUINS PHOTOGRAPHED FROM AN AIRPLANE

The first attempt to photograph submarine ruins was recently made by the late Prince de Walbeck, who was killed last June on his way back from Carthage. His airplane photographs are a unique documentation in archeology, and are superior to any observations which could have been made at the surface of the water. They bring to view constructions submerged thirty feet at a distance of one hundred yards from shore.

The pictures were taken at a height of 1,000 feet, and also at 400 feet, following the line of the ancient wall. One is able to study the topography of the peninsula to excellent advantage. The bed of the Medjerda is clearly visible and the wall of Theodosius can be partly seen. Even the Roman allotments are defined.

This airplane photography established the fact that there had been a port at La Marsa (the Arabic el Mersa means a port). The construction perceived under water is of vast dimensions and zigzags from Cape Carthage northeast to Cape Kamart.

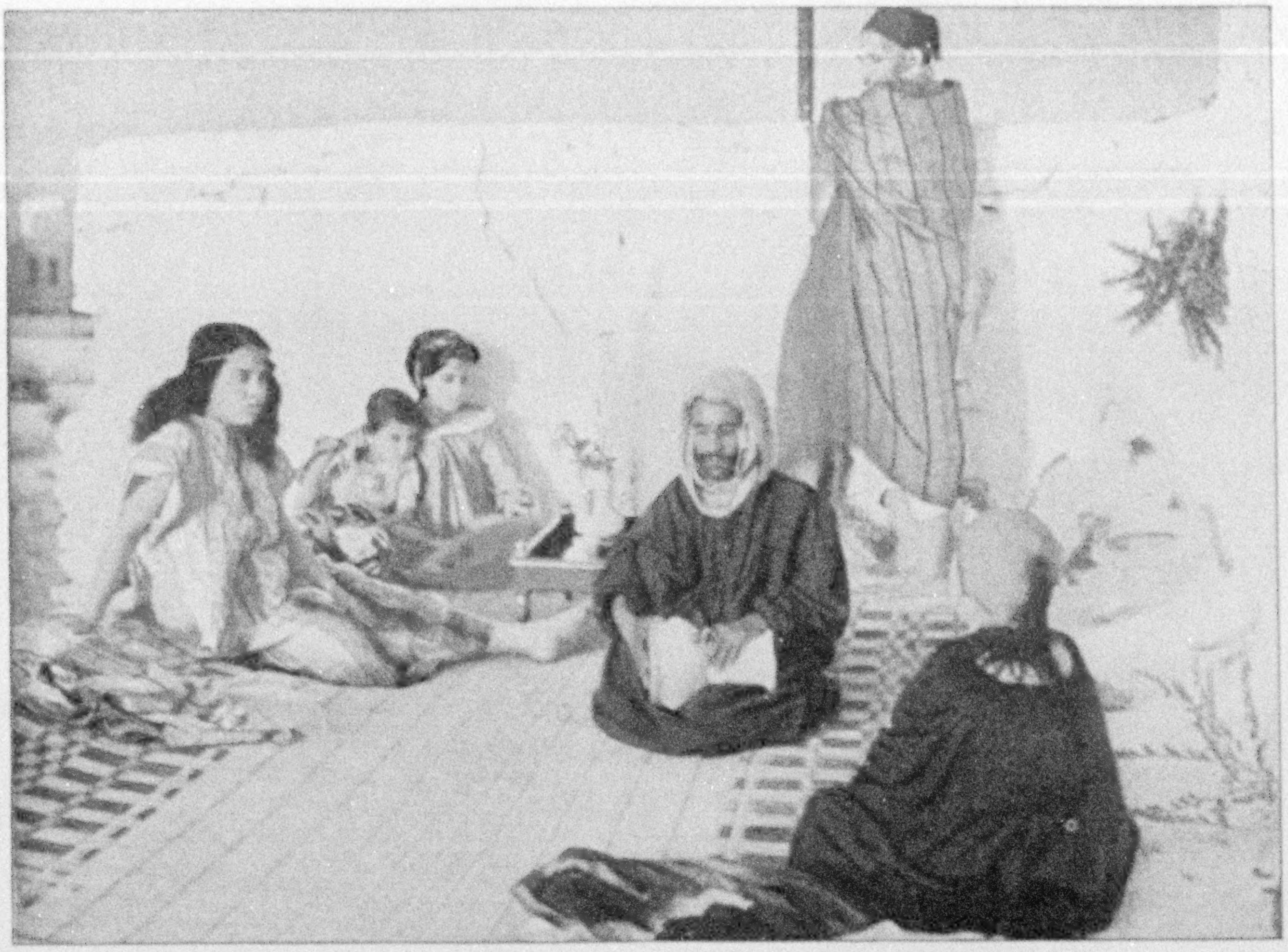
GREEK ART TO BE RECOVERED FROM A SUNKEN GALLEY

Off the coast of Mahdia, more than a hundred miles south of Carthage, was observed by airplane a sunken galley 120 feet below the surface of the water, the existence of which had been known to sponge divers. I have obtained the consent of the Service des Antiquités to continue the work of recovering from the galley the specimens of Greek art, some of which were removed prior to the war.

In the Bardo Museum of Tunis have already been placed magnificent marbles and bronzes taken from the treasure ship, where they had reposed since 100 B. C., and not 500 A. D., as stated in certain works of reference.

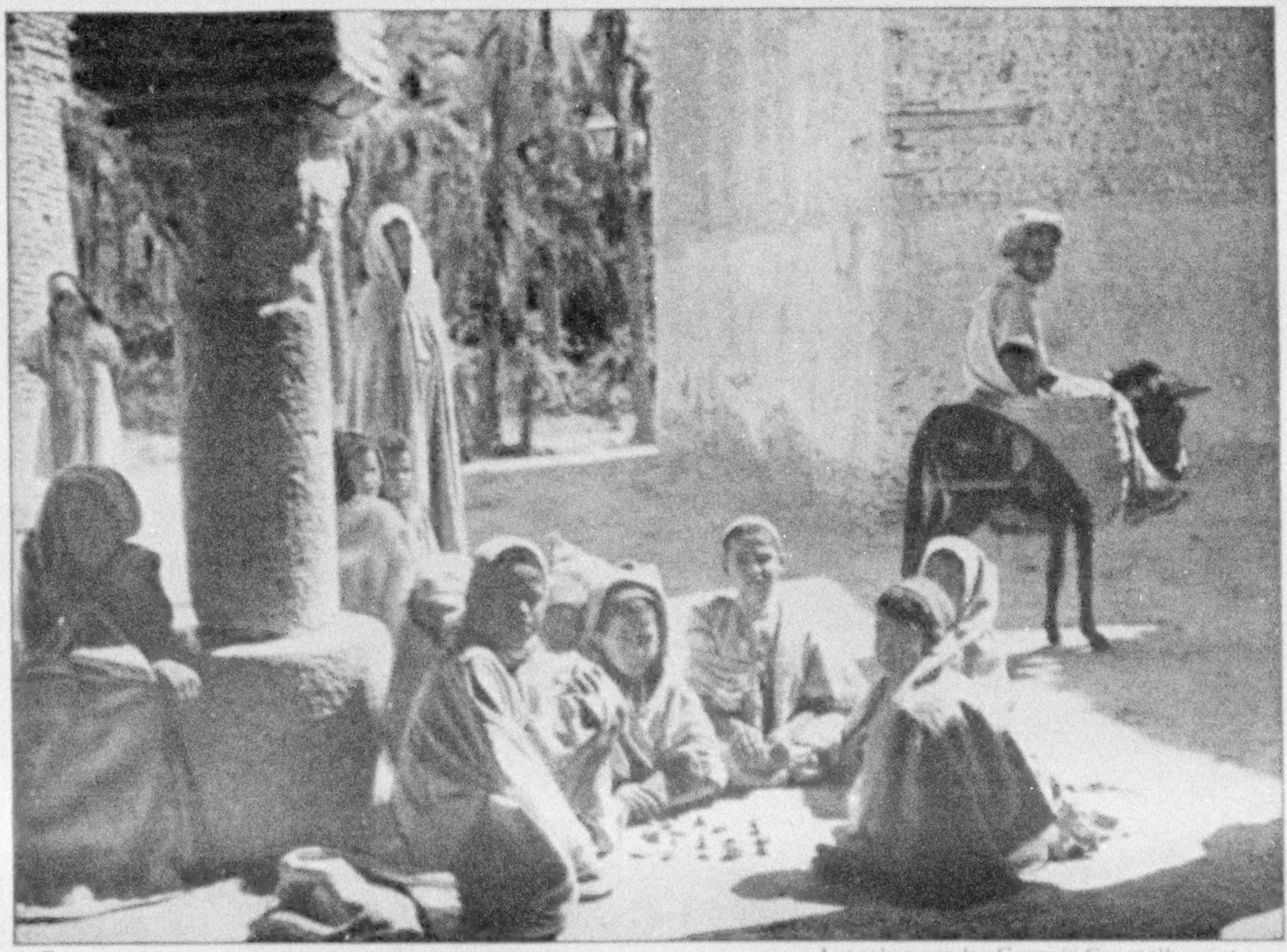
The Gulf of Tunis has been further explored by us in recent months in the expectation of locating some of the 500 ships which met their fate during the Punic wars. One of Genseric's booty ships is known to have sunk in the gulf after the Vandals sacked Rome in 453 A. D. In the continuance of this work the airplane will play an important part.

Further evidence that Punic Carthage did not lie beneath Roman Carthage was recently afforded by a discovery on the part of Père Delattre northwest of the Hill of Bordj el-Djedid (see map, page 394), where a large quantity of Punic incense burners of about 400 B. C. were unearthed (see page 413). This is two miles from the site commonly considered by historians. The only Punic statue found thus far (see page 405) is likewise accredited to Père Delattre, and that was beneath the garden of the Lavigerie



THE POET RECITES HIS LAY

The entertainer, being blind, is admitted to the sacred precincts of this Tunisian home. During childhood the little daughters of Tunis wander at will through the vivid throngs of the city, but at thirteen they assume the Mohammedan veil of femininity, and henceforth their activities are much restricted.



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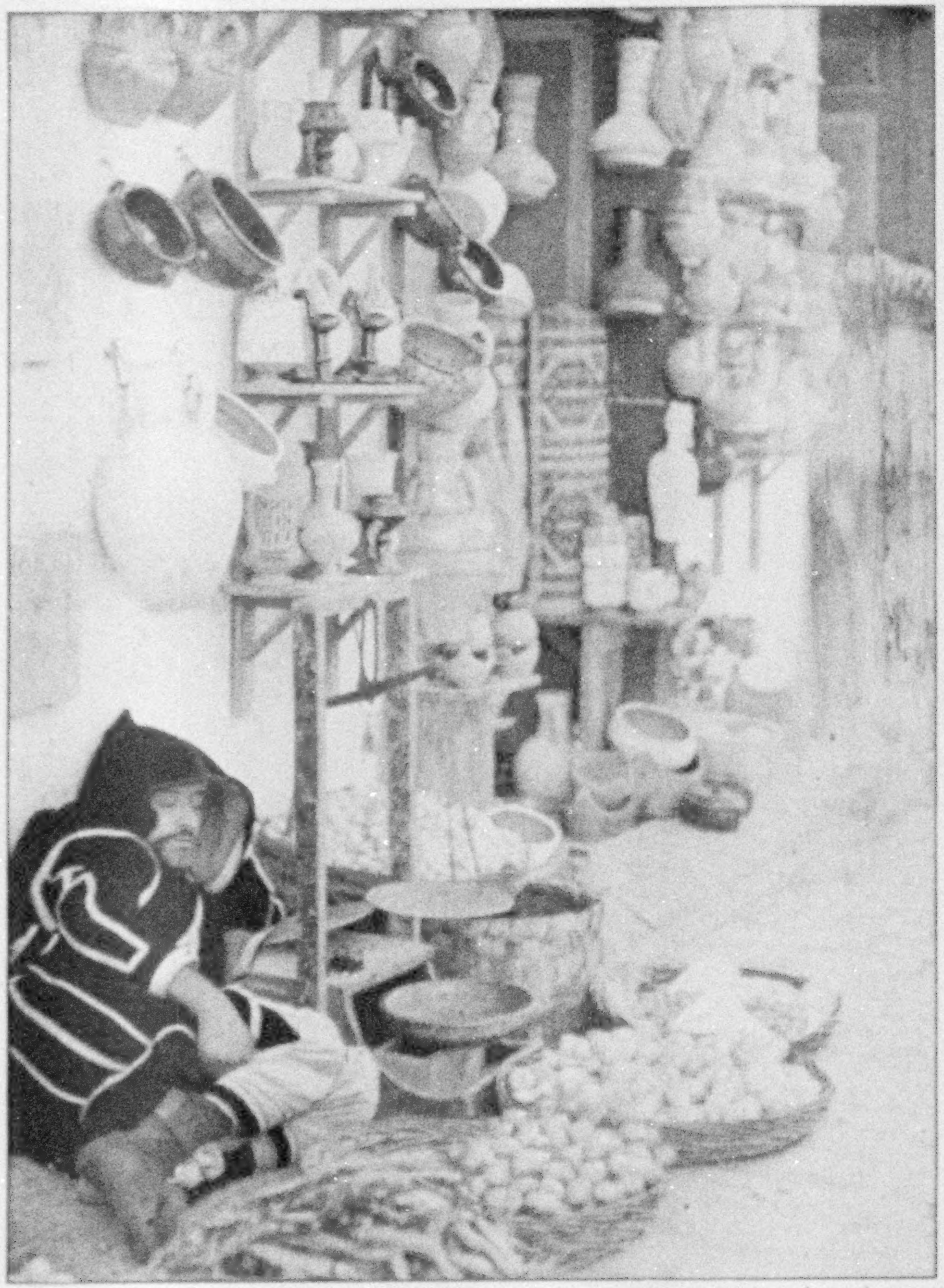
CHILDREN OF THE OASIS OF TOZEUR

Tozeur, an oasis lying 300 miles to the south of Tunis, is notable for the richness and variety of its vegetation. The dates of this and other Tunisian oases are famous the world over.



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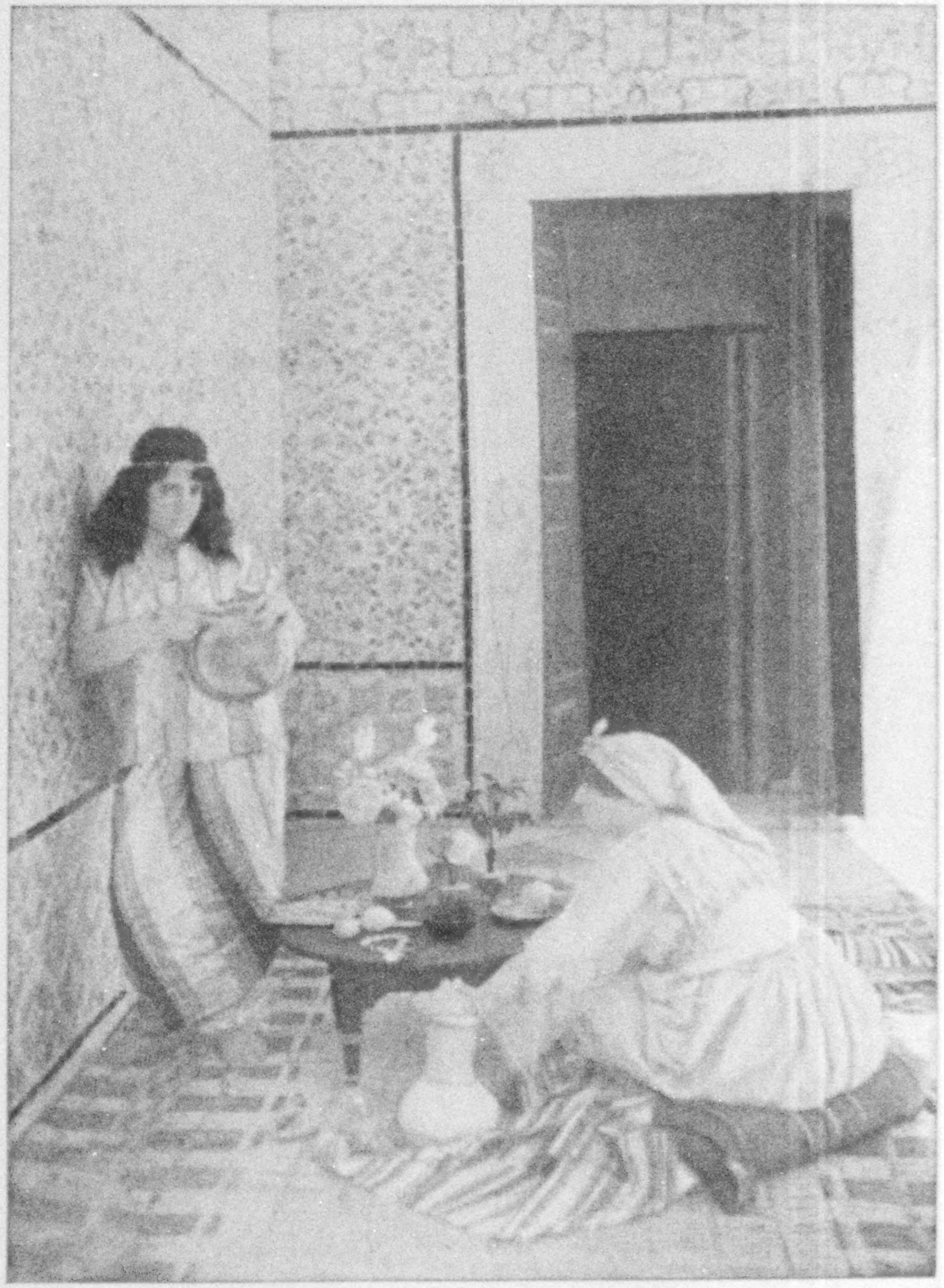
A POTTERY MERCHANT WAITING FOR CUSTOMERS

The glare of the African sun is shut out of the business district of Tunis by vaulted roofs, and the shopkeepers laze before the windowless recesses in the walls which constitute their stores. The Tunisians have manufactured pottery for centuries—a kind of majolica in green and yellow and a reddish, sun-baked ware ornamented with conventional designs.



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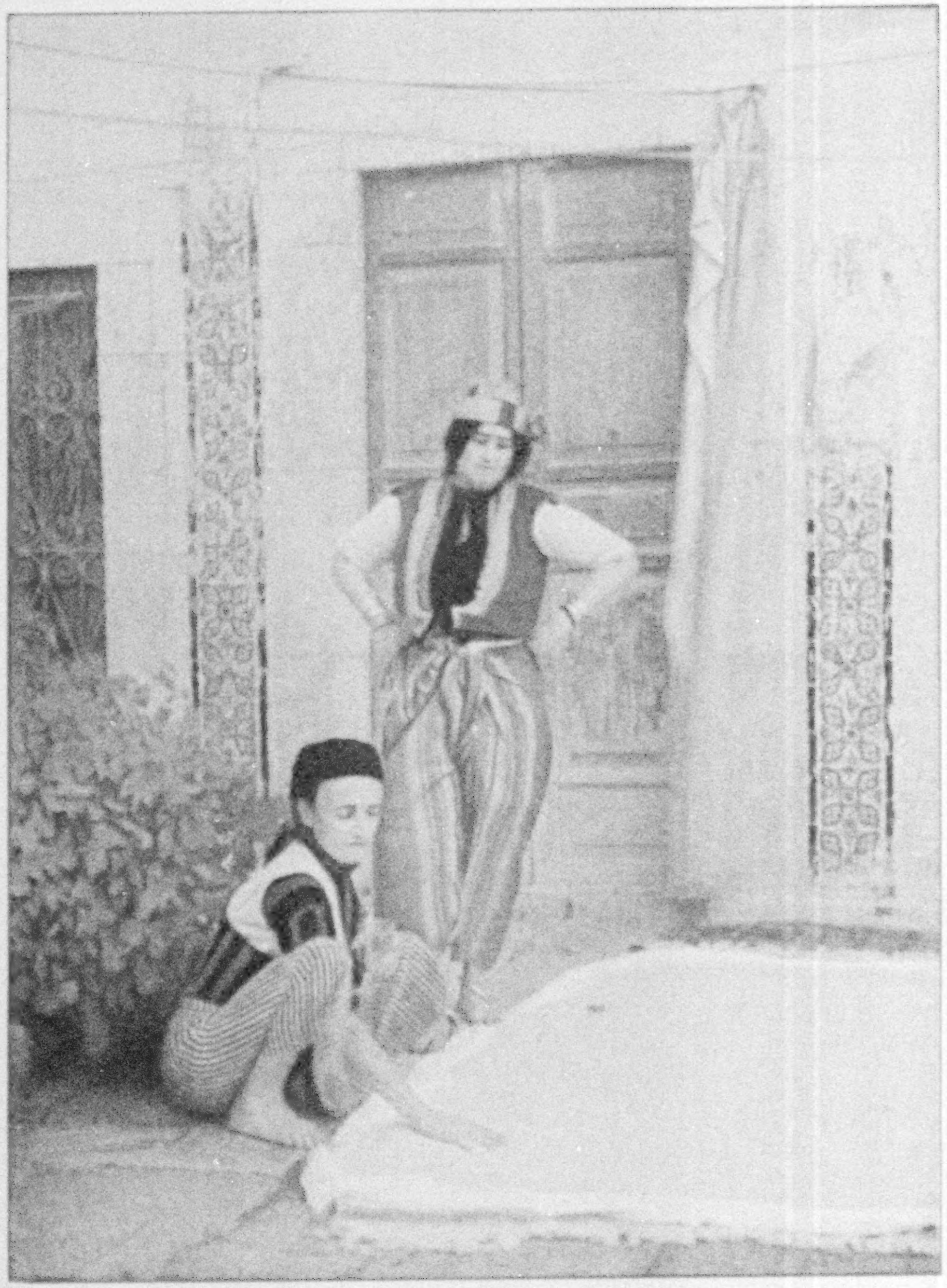
TUNISIAN WOMEN AT HOME

Upper-class Mohammedan women of Tunisia are seldom seen on the streets; when women of the middle class walk abroad they wear veils of jet-black crepe, and in addition hang before their faces curtainlike pieces of richly patterned silk, which make it impossible to see more than a few feet to the front.



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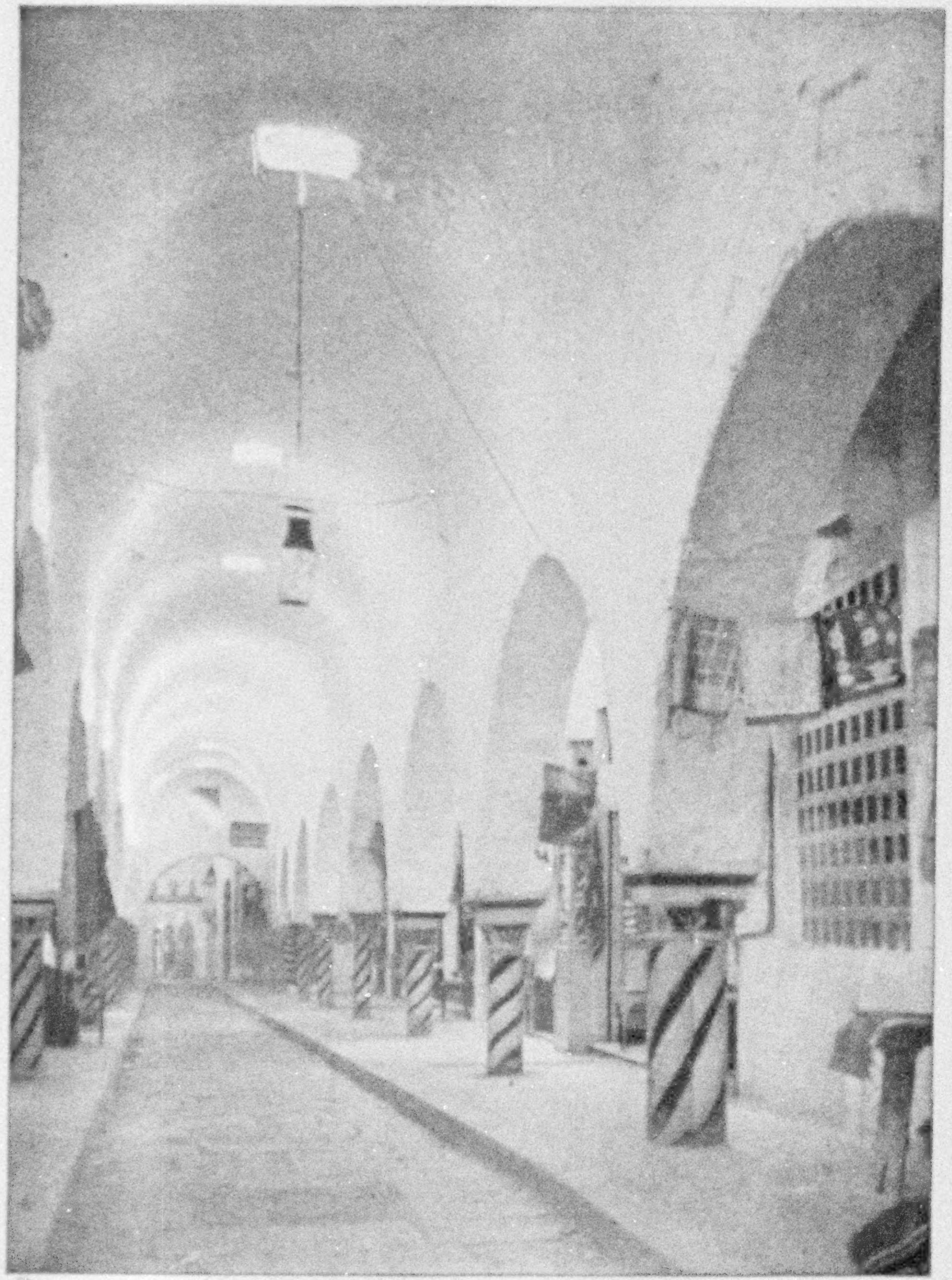
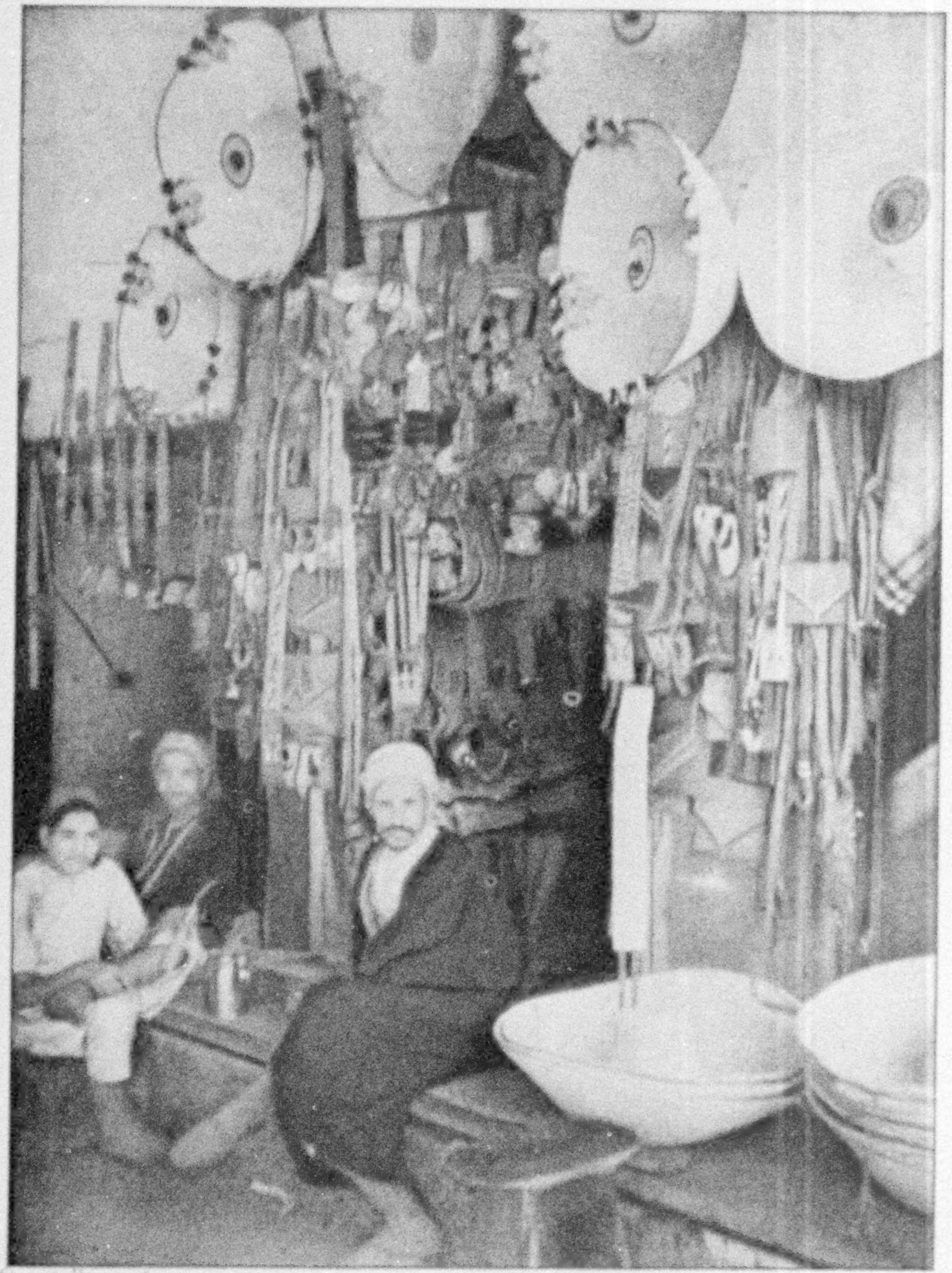
A FAVORED DAUGHTER OF THE HAREM

Neither Jew nor Mohammedan in Tunisia is supposed to see his bride before marriage. She may be chosen by his mother, according to her own tastes, or she may be selected by his father to advance his business interests. Sometimes he is put down for marriage as soon as he is born. Both Jewish and Arab women retain full rights over their personal estates after marriage, however.

DRYING WHEAT AFTER IT HAS BEEN WASHED

Wheat is the chief cereal grown in Tunisia, but the system of agriculture is primitive. Most of the farmers clear their land or do their plowing with crooked sticks. Perhaps the most successful branch of agriculture is grape-growing, for the vine seems to thrive in the sun-baked soil, and some eleven million gallons of wine are produced annually.





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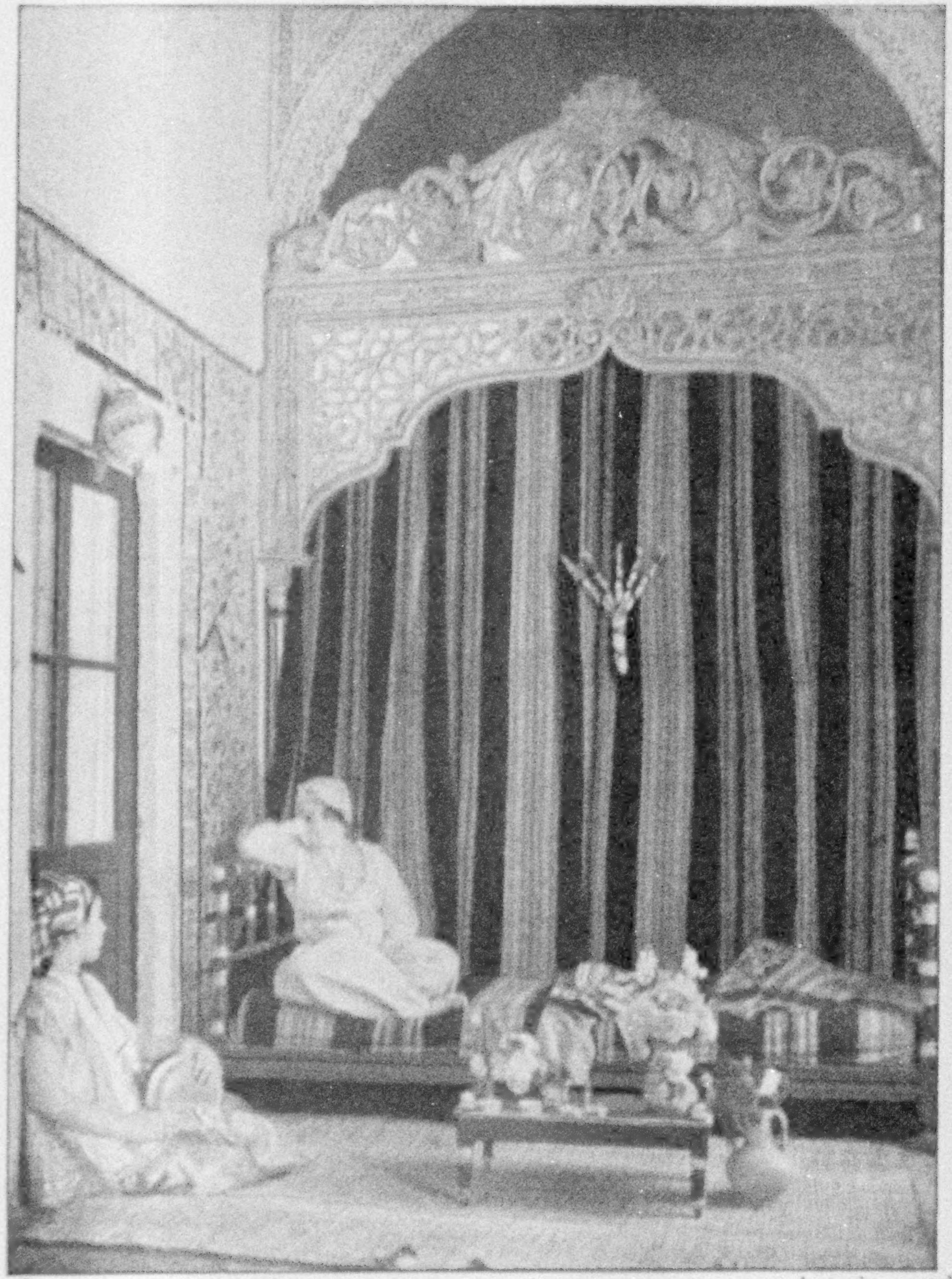
THE SOUKS, OR COVERED SHOPS, OF TUNIS

Each craft in Tunis has its own street, and the best guide through the mazes of this covered world is one's nose, as the city is notorious for its smells. From some of the provinces of Tunisia many aromatic herbs and fragrant flowers come to tempt the perfumer to the perfection of his art in the Souk el Attarine, or Street of Perfumes.

THE HAT AND LEATHER SHOP OF A TUNISIAN MERCHANT

Saddlery and leather embroidery are two of the most important industries of this part of northern Africa. The craftsmen turn out gorgeous high-backed crimson saddles with mountings in brass to catch the fancy of the expert horseman, and fascinating bags, cardcases, belts, and rug-straps to please the impressionable tourist.



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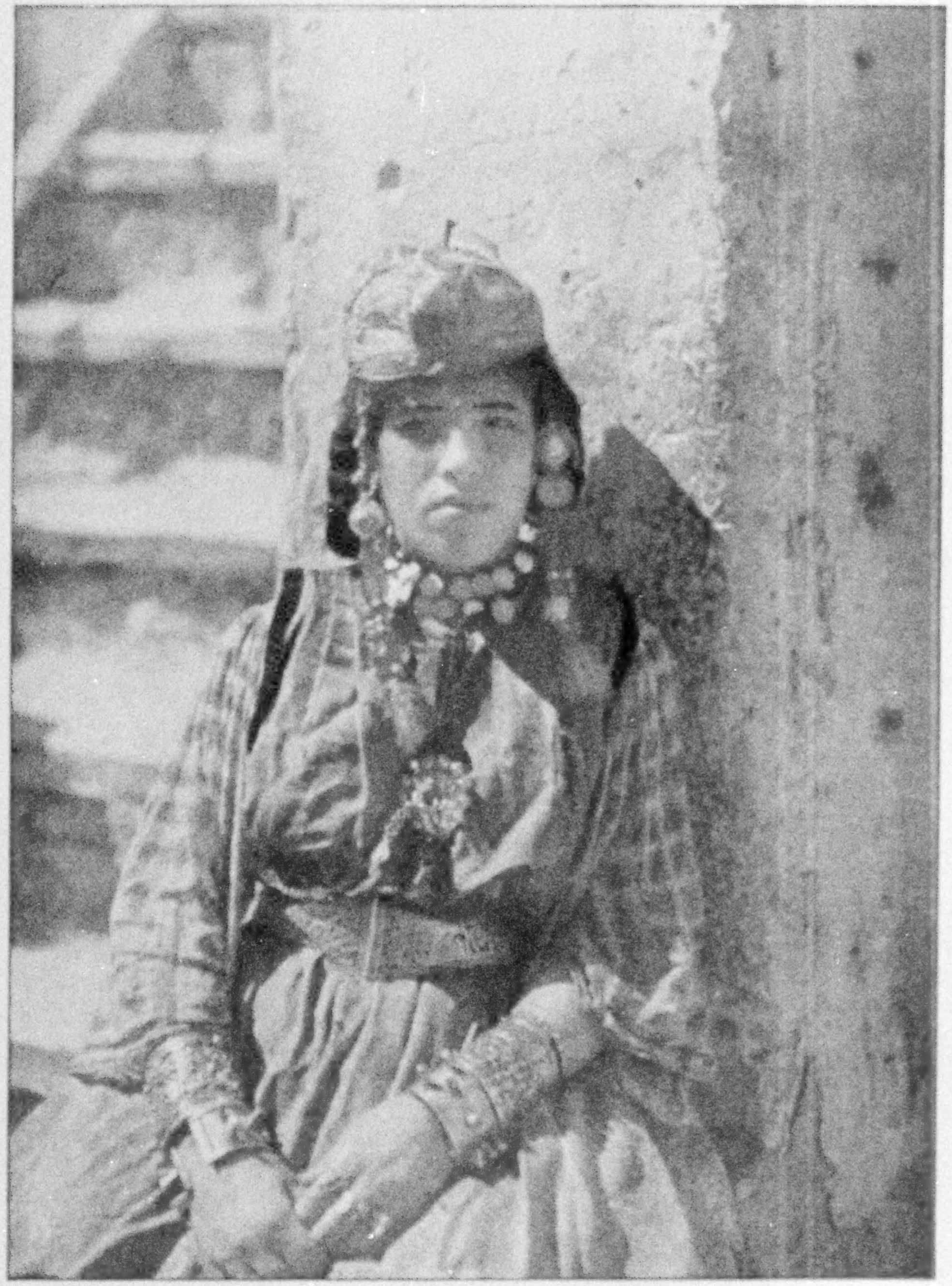
THE CANOPIED BED OF A TUNISIAN INTERIOR



A DESERT BEAUTY

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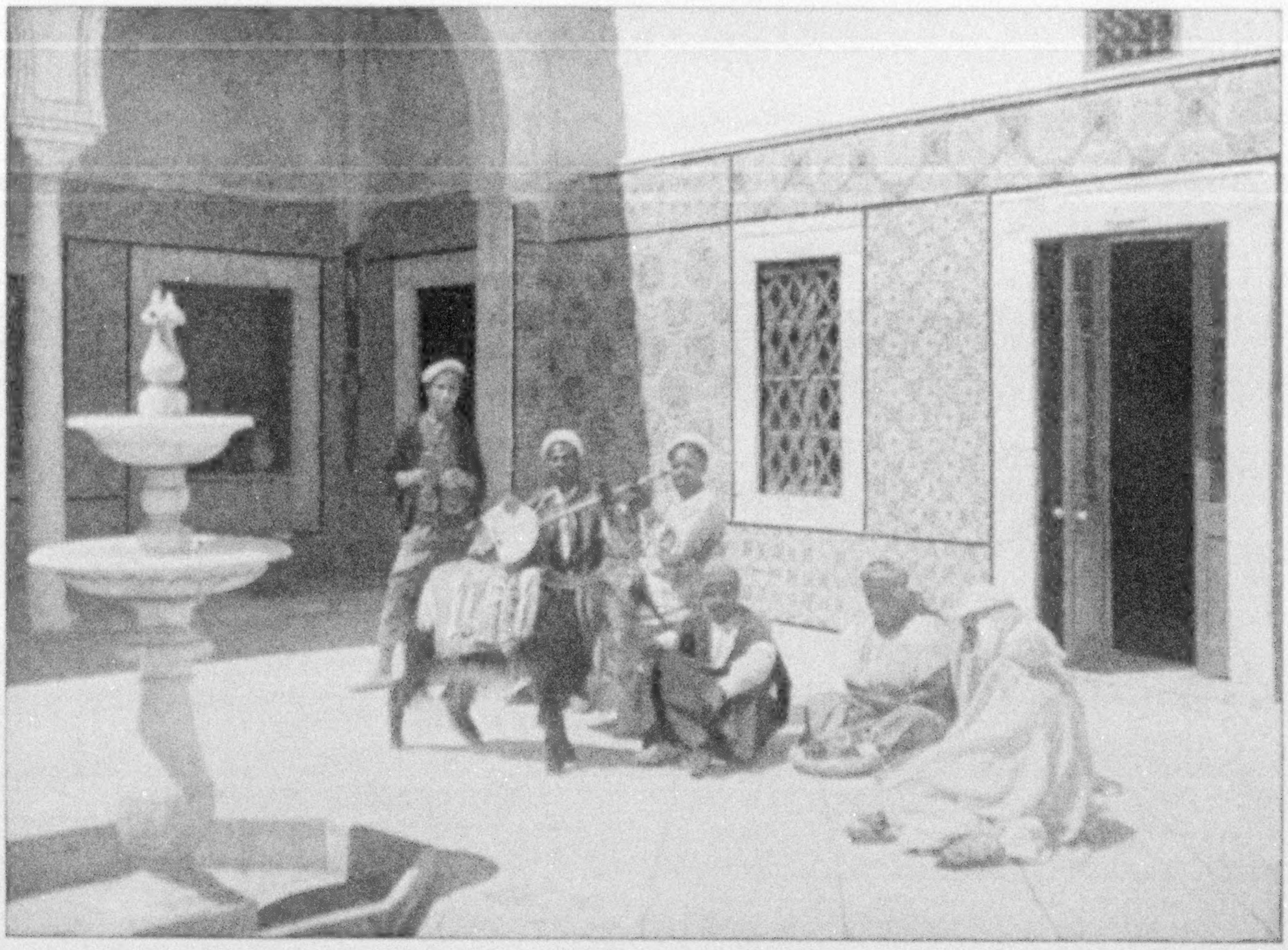
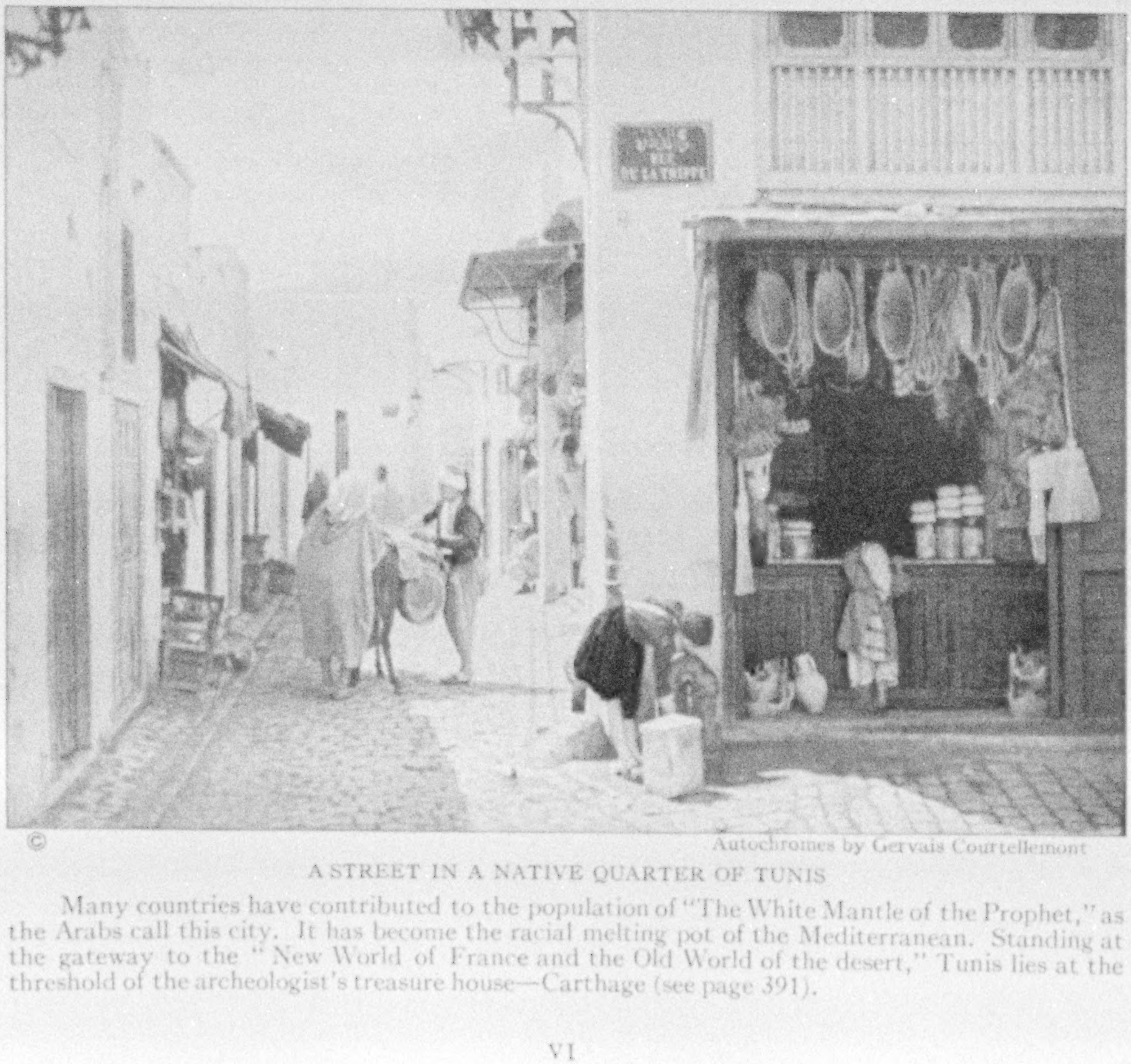


TELLING THE FAMILY'S FORTUNE: TUNIS



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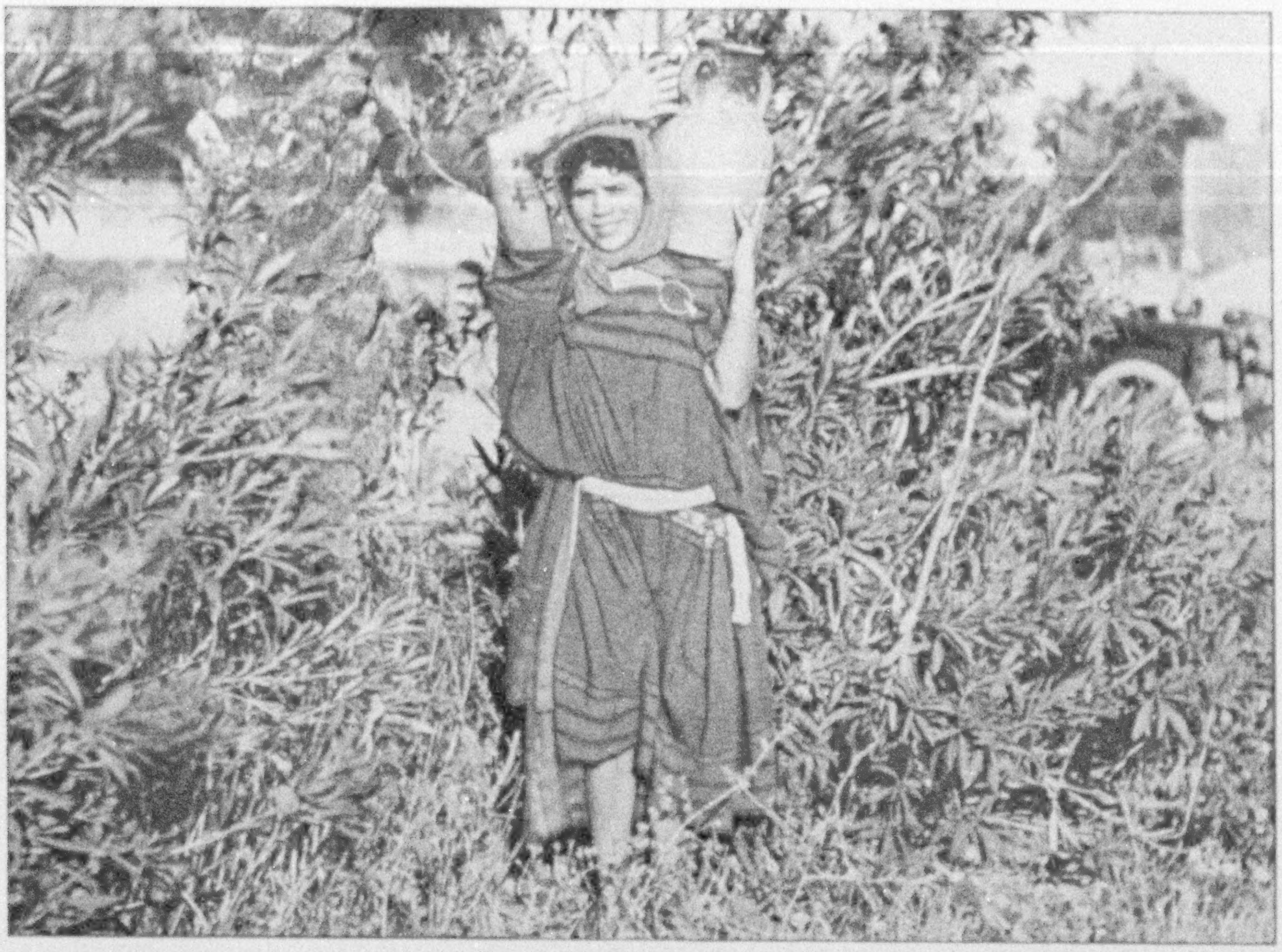
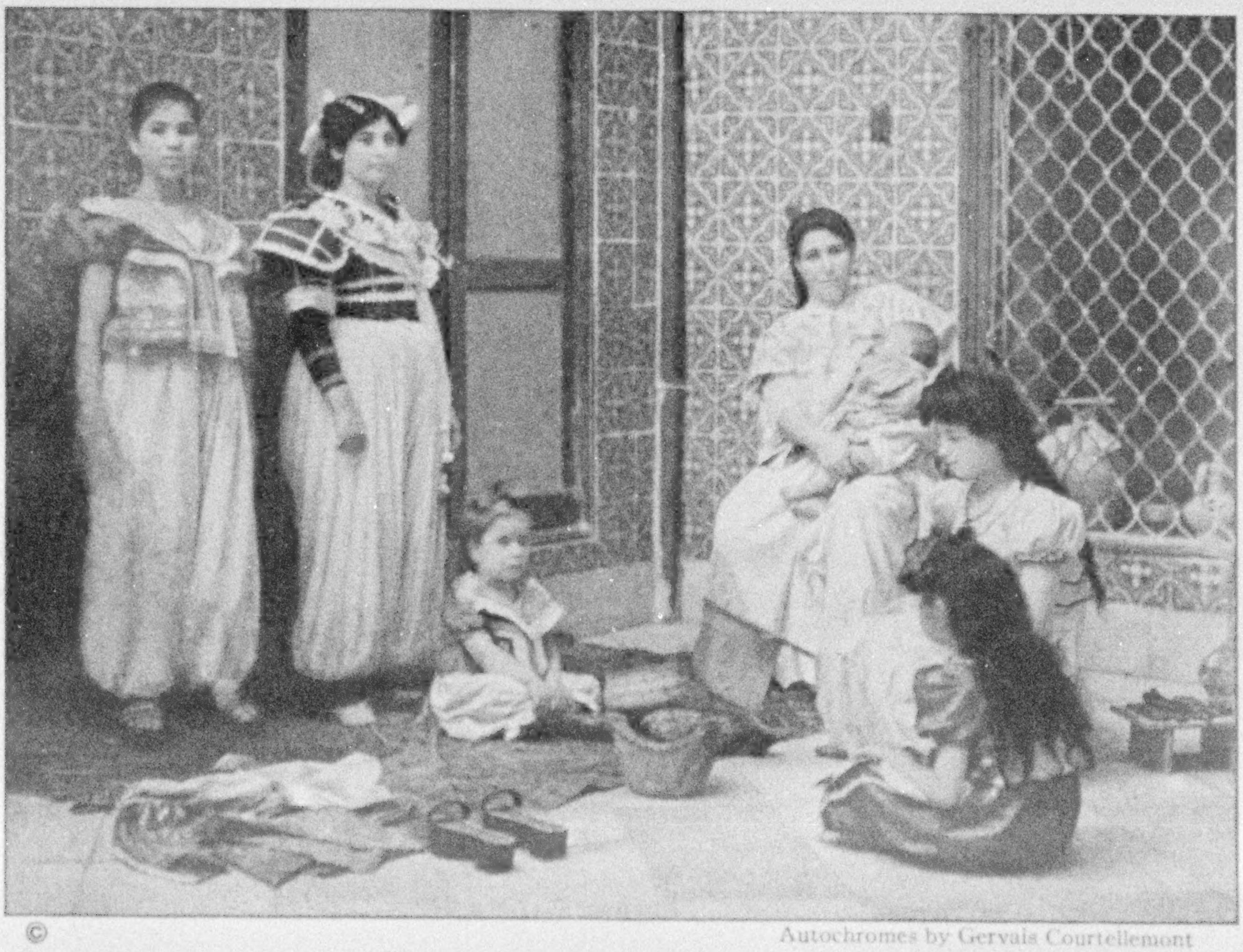
A STREET IN A NATIVE QUARTER OF TUNIS

Many countries have contributed to the population of "The White Mantle of the Prophet," as the Arabs call this city. It has become the racial melting pot of the Mediterranean. Standing at the gateway to the "New World of France and the Old World of the desert," Tunis lies at the threshold of the archeologist's treasure house—Carthage (see page 391).



A BEDOUIN GIRL OF SOUTHERN TUNISIA



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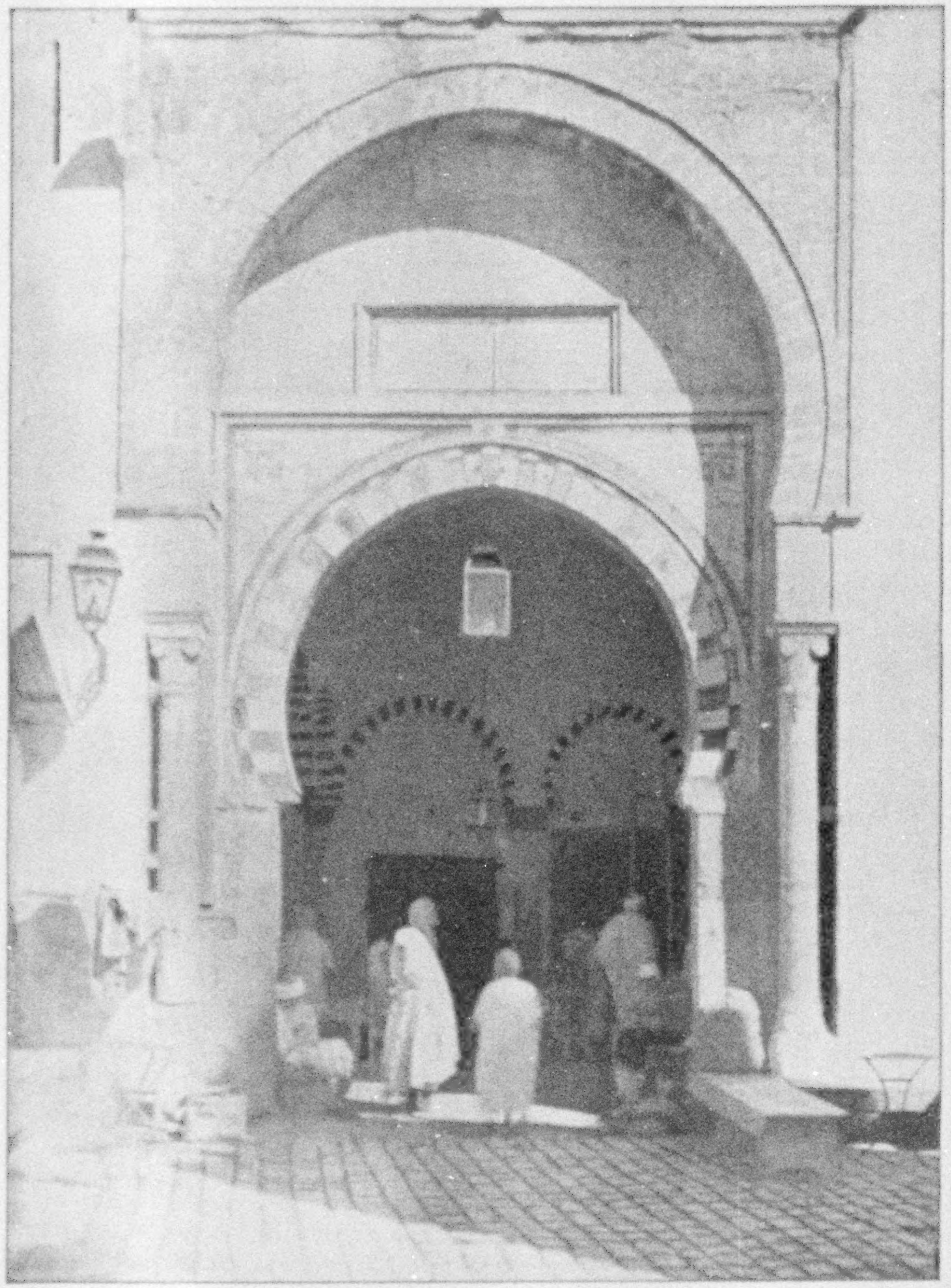
A JEWISH FAMILY OF TUNIS

Among the 200,000 people in the capital of Tunisia the Jews are exceeded in numerical strength only by the Mohammedans and the Italians. In fact, Tunis was mentioned at one time as an ideal place for the establishment of the new Jerusalem. Obesity is considered a mark of great beauty among Jewish women of Tunisia.



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THE CITY DOOR OF SUSA, ON THE TUNISIAN COAST

Autochromes by Gervais Courtellemont

A TUNISIAN COUNTRY WOMAN

building at La Marsa, three and one-half miles from the Carthage of to-day.

No land has more wondrous or more beautiful Christian ruins than North Africa. From Shershel, in Algeria, to Carthage, in Tunisia, the pilgrim follows the sacred way of the routes of the basilicas, where every step treads on holy ground, sacred to the blood of saints and martyrs.

OLDEST REMAINS OF CHRISTIAN EDIFICES

Few, indeed, know the importance of the African ruins, which are the oldest remains of Christian edifices in the world!

If one wishes to see what the first Christian churches were like, it is not to Rome one should go, but to Africa. They do not exist any more in Rome, for they have all been destroyed or built over; but at Carthage and Tebessa one can still see the largest basilicas in the world and easily imagine what they were in the days of St. Augustine.

Two hundred and fifty basilicas, churches, and chapels have been discovered and partly explored; thousands of Christian inscriptions, tombs, and relics laid bare, and yet there has never been a pilgrimage to these sacred and beautiful ruins.

Some of the most wonderful catacombs and cemeteries of the first centuries of Christianity are to be found at Susa (Sousse) and at Tipasa the deserted, with its basilica dedicated to St. Salsa, one of the most celebrated African martyrs; Tebessa, the largest early Christian ruin on earth, so reminiscent of the day of St. Augustine; Souk Ahras, the home of that saint; Hippo, where only a few stones and the name of one good man remain; and then to Carthage, where the great St. Louis of France died and where the glorious martyrs, St. Cyprian, St. Perpetua, and St. Felicitas suffered for the Christian faith (see page 401).

Carthage, too, is sacred to the memory of St. Vincent de Paul and of Tertullian. Pope Leo IX said: "There is no possible doubt that the bishop of Carthage is the greatest after Rome and the greatest metropolitan of Africa."

MYSTERY STILL VEILS PUNIC CARTHAGE

It is still evident that only profound investigation can pierce the veil of mystery which shrouds the site of the great Phœnician city. The most painstaking search through the Peninsula of Carthage is required to substantiate finally all of the new theories which have been developed of late.

My own explorations convince me beyond all doubt as to the error which has persisted for centuries regarding the location, and such progress as I have been fortunate in making is due to a few records of ancient historians, the Arab documentation of the Middle Ages, a study of geographical changes, and the excavations of the last five years.

Through all the desolation of the surroundings and amid the débris that blankets the entire peninsula, the voices of Hannibal, Scipio, St. Augustine, St. Louis, St. Cyprian, and other mighty spirits seem to summon the modern world to the task of discovery and enlightenment.

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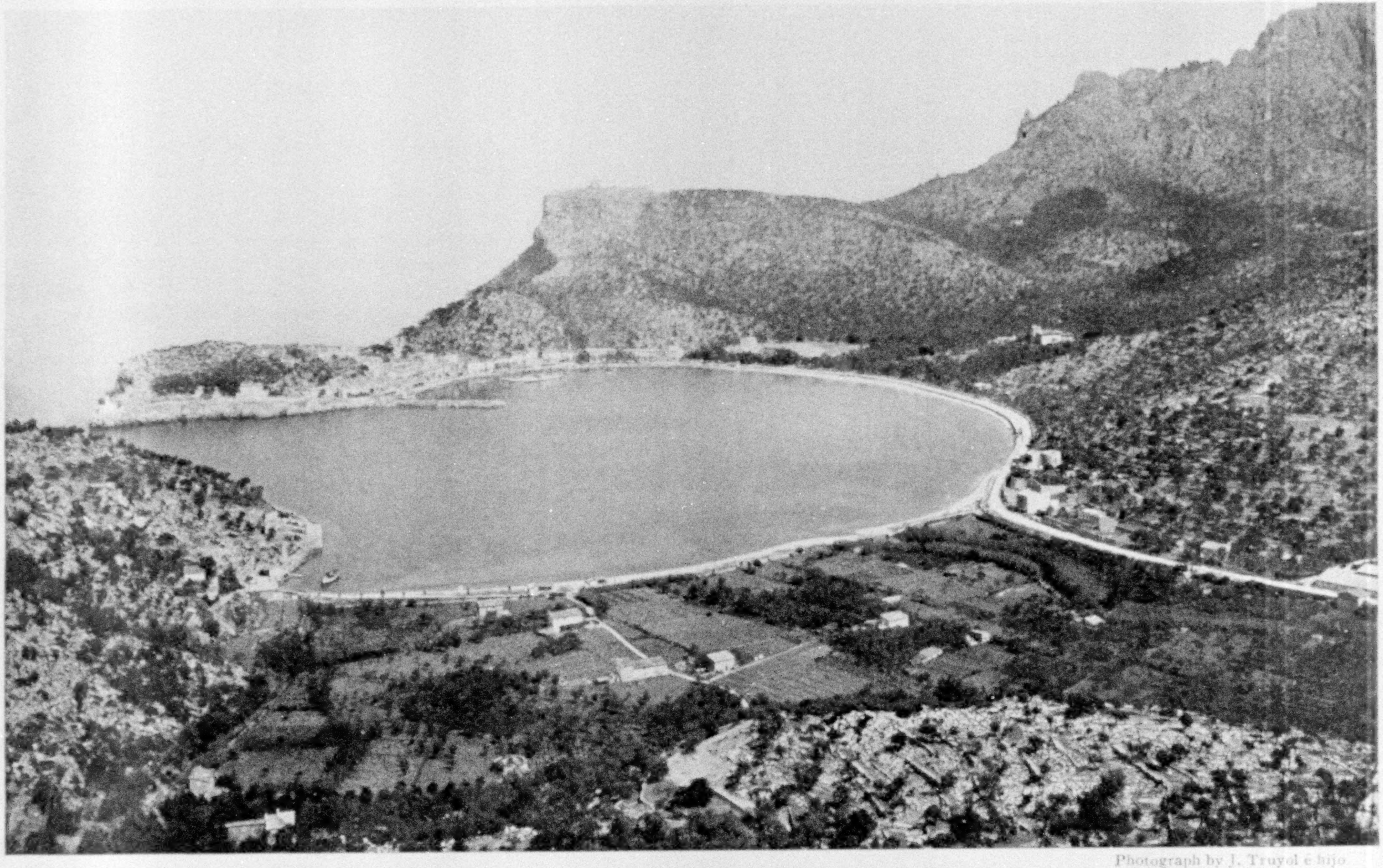


Photograph by J. Truyol e hijo

THE NATURAL HARBOR OF SÓLLER, ON THE ISLAND OF MAJORCA

Crowning the distant promontory is one of the medieval towers from which the islanders kept watch against Moorish pirates (see text, page 431).

KEEPING HOUSE IN MAJORCA

BY PHOEBE BINNEY HARNDEN

"CEYLON is only forty miles from heaven," said the enthusiast, as we sat on the deck of a steamer bound for the Far East. It was then that the uncommunicative man, who had lived there, looked up and quietly asked, "Why the forty miles?"

That was the way we felt about Majorca after our first trip—and in fact have felt so ever since.

Why the Balearic Islands should be so little known to the modern tourist is a mystery, albeit a pleasant one. Even in the times of the Bible, the strength and valor of the "Balearic slinger" were well known; and before that the wild bravery of the Majorcan seems to have been worthy of comment. Fortunately, his warlike character seems to have evaporated with time, leaving a country whose tranquillity is untouched either by modern hurry and bustle or the equally hurrying and bustling modern tourist.

It is my instinct to keep it all as secret as possible. When Palma, the capital, called, and rightly so, by the ancients "The Pearl of the Mediterranean," is within overnight distance from Barcelona and but little more from Marseille, it would be painfully easy to overrun the place and so spoil this seemingly unique spot.

We discovered it quite by chance ourselves. With the help of guidebooks, we had been traveling in fancy all over Europe searching for just such a spot. Then a friend assured us the only place to go was Majorca. In our attempt to look well-informed we evidently only attained blankness of expression, for enlightening explanations hastily followed. Mary Stuart Boyd's book, "The Fortunate Isles," was given us for our edification, and from that time we began our career of enthusiasm for Majorca, the largest and most beautiful of the Balearic group.

Mrs. Boyd had a house in Deyá, one of the small villages of about 800 inhabitants (see map, page 431), where she said we might go. It had once been the wing of an old monastery, and though we were warned of rough simplicity, off we started, bag, baggage, and baby.

It worried us not at all that none of us spoke a word of Spanish, and it worried us less when we saw our little stone house, overlooking the blue waters of the Mediterranean, with its olive terraces leading to pine-covered bluffs beyond.

What did it matter if the trip to our daily swim was half a mile down and a seeming five miles back? The clear warm water, surrounded by adventurous-looking rocks and caves, made the best swimming we had ever experienced; and then the terraces, with their twisted olive trees, planted by the Moors over a thousand years ago, looked like a Rackham illustration for "Peter Pan." Figs and oranges we might pick freely with no thought of irate owners.

In the little rose- and honeysuckle-filled garden, with its flagstone paths covered by a grape arbor, we used to sit and have our meals from a great stone table where the monks ground their corn. That garden alone seemed compensation enough for the whole journey, to say nothing of the cold, clear spring around which was the rough bench where the monks were wont to sit for rest and recreation.

THE FAMILY DECIDES TO OWN ITS MAJORCAN MANSION

It mattered little, too, if the door, whose thickness and great iron bars might keep out any reasonably sized enemy, could not keep out the wind, nor in fact the dog, so great was the—shall I call it lack of precision of door jambs? The weather was balmy and it was not until the rains set in that we thought of moving to our new house. We had not been in Deyá de Majorca a week, however, when we decided, with a unanimity one strives for and seldom achieves in family circles, that here we must have a house of our own.

We began housekeeping with difficulties.

With what glee did we work out Spanish sentences constructed from dictionary and phrase book, planning literally to astonish the natives; and with what sinking hearts did we watch the puzzled expressions with which they were received! It was only after our sentences had been met with a blank stare that we learned that many, probably the majority, of the inhabitants speak only Majorcan, a dialect impossible for a mere Spanish student to understand.

Those first days the local doctor was a busier man than he had been for many moons. He spoke a little French. At least twice a day he was hastily sent for, and most courteously, and incidentally gratuitously, came, though it was a mile from his home, in order that we might tell him in our very bad French that it was impossible for us to drink goat's milk, and request him to inform the servant of the fact; or that we would like fresh rolls every morning by the *diligencia.*

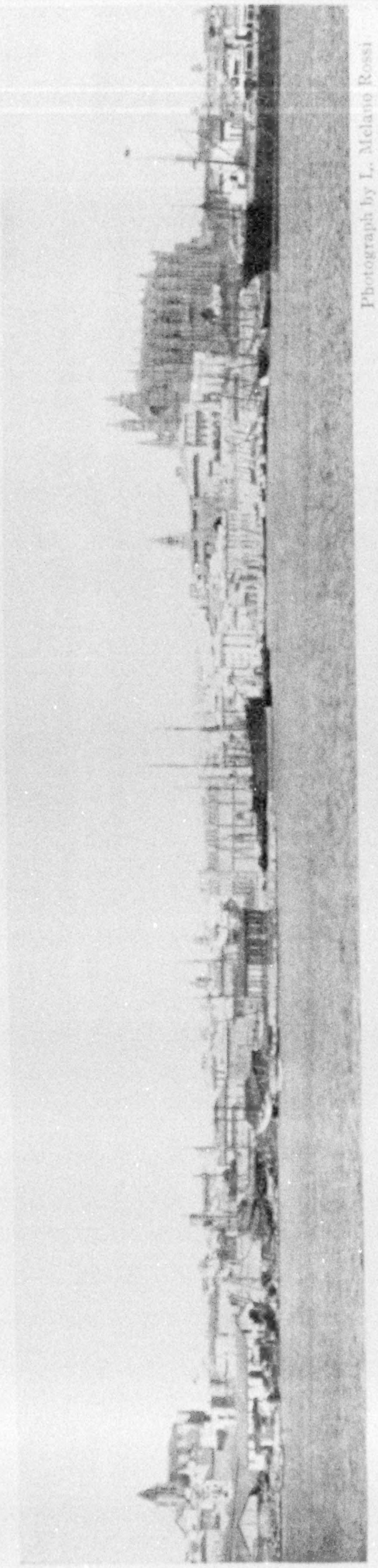
TRIALS WITH LAMPS

The one amenity of life that we had been promised was acetylene gas made for our own lamps. Whether it was because we were particularly uncongenial with the amenities, I cannot tell; but I do know that we never achieved the acetylene gas. There was invariably a flare that made everyone apprehensive while it lasted—which was never more than a few minutes, however—followed almost immediately by a pinpoint of light that we came to call "yon illuminat," but which did not illuminate enough even to make darkness visible.

The natives all use the picturesque, small, open, oil-burning lamps, like those of the early Christians, that have become associated in our minds with museums and catacombs. We even tried those; there is nothing like surrounding one's self with "local color." But they literally smoked us out of house and home, and we finally resorted to the common home-grown lamps and candles.

What we would have done those first weeks without the unfailing courtesy and patience of our fast-forming circle of friends and neighbors I do not know.

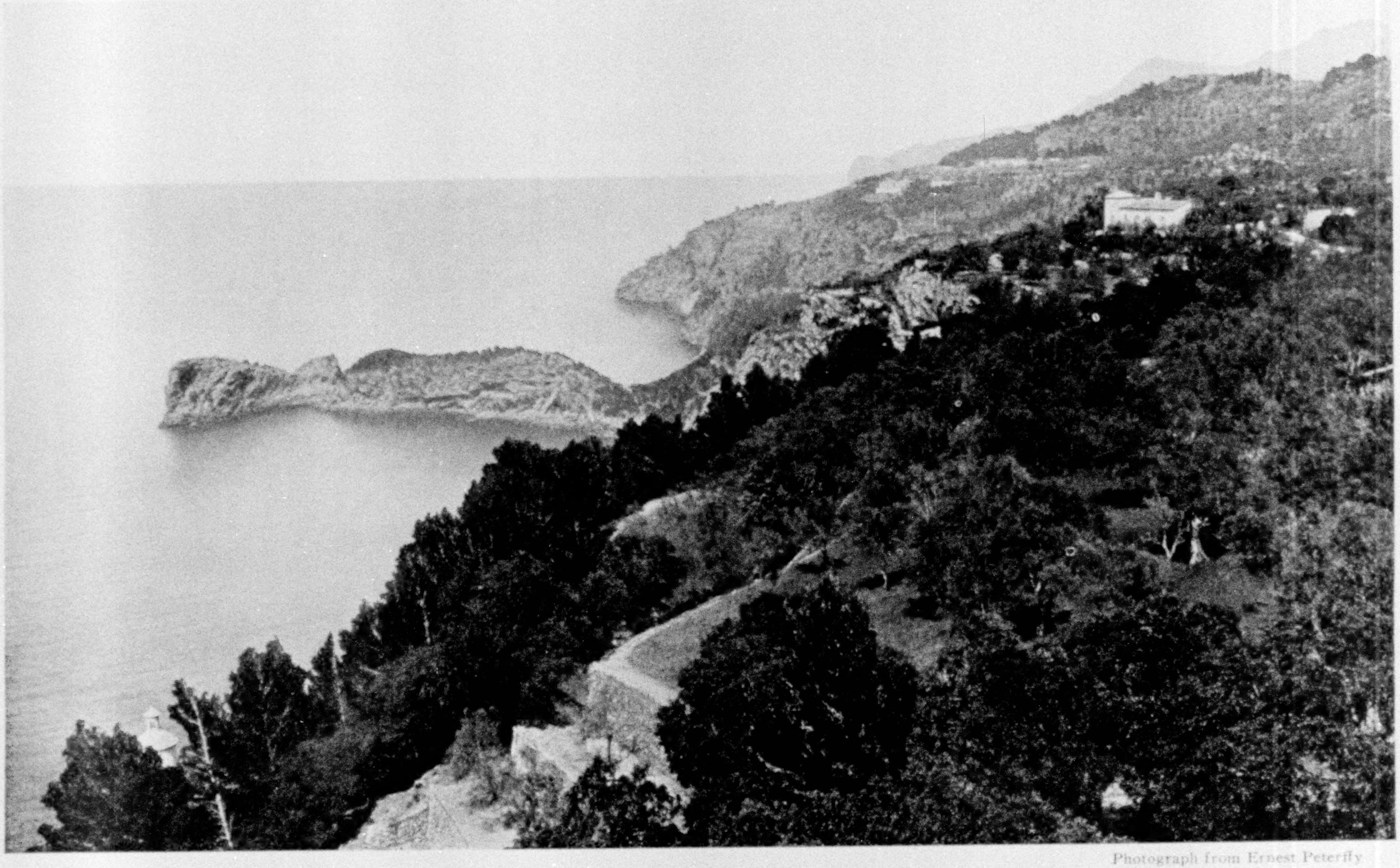
All our marketing had to be done by signs. And what contortions we went through! Eggs were, for instance, a comparatively easy order. One can always indicate the shape of an egg with



Photograph by L. Melano Rossi

A GENERAL VIEW OF PALMA, ISLAND OF MAJORCA, CAPITAL OF THE BALEARIC ARCHIPELAGO

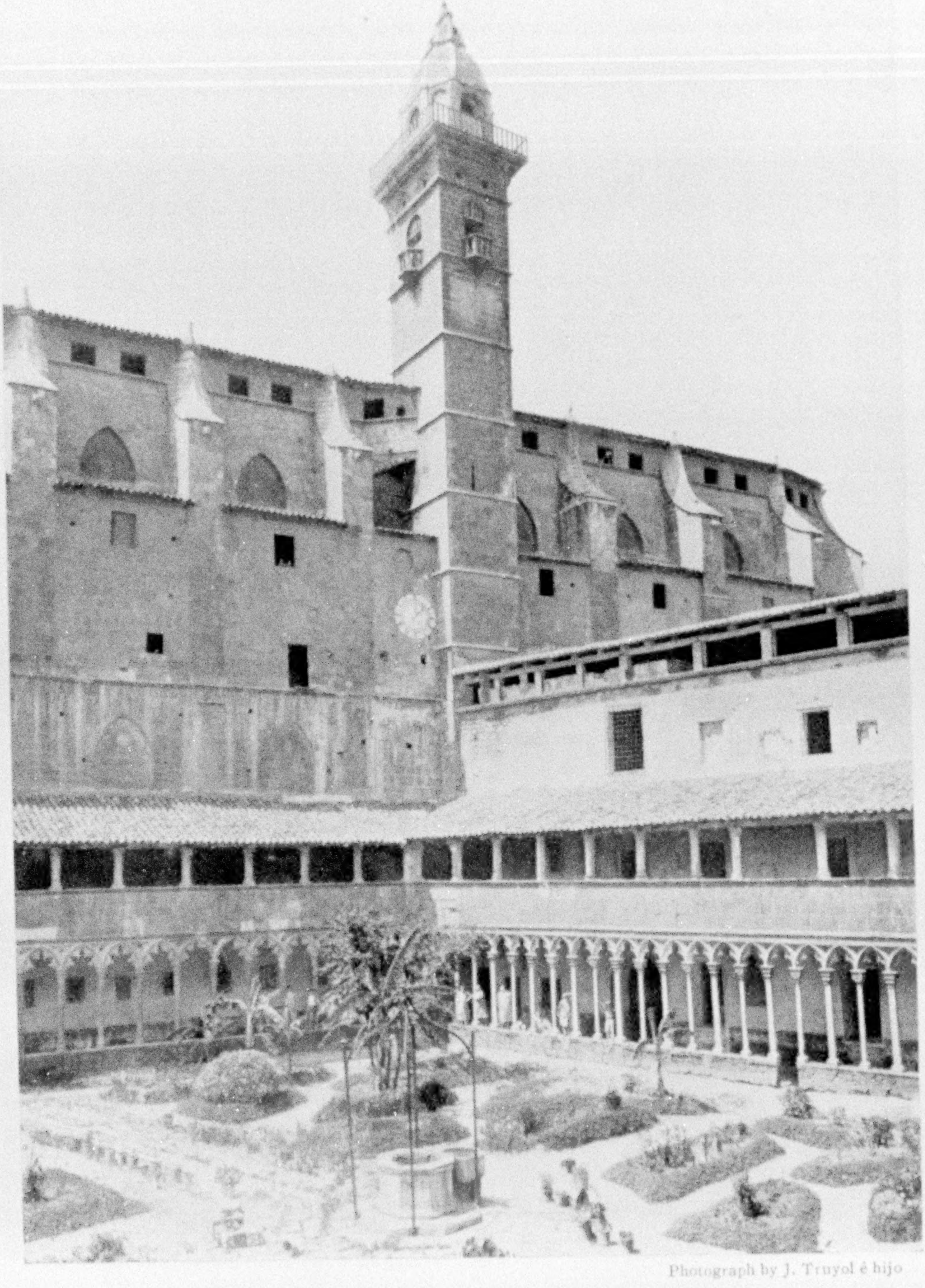
The Carthaginians were the first civilized people to settle in the Balearic Islands. Shortly after the destruction of Carthage (see page 391), the Romans accused the islanders of piracy, sent Metellus to subjugate them, and established a colony of 3,000 Romans and Spaniards, who founded the city of Palma. The imposing building to the right is the cathedral, begun in 1230 by James I (Jaime).



Photograph from Ernest Peterffy

ALONG THE NORTHWEST COAST OF MAJORCA

In the foreground is the park and country-house of Miramar, estate of former Archduke Ludwig Salvator of Austria, who used to spend his summers on the island and who wrote a voluminous work on Majorca and the Balearic Islands (see text, page 431). At the left, in the sea, is the *roca perforada* (perforated rock).



Photograph by J. Truyol é hijo

THE CLOISTERS OF THE CHURCH OF SAN FRANCISCO IN PALMA

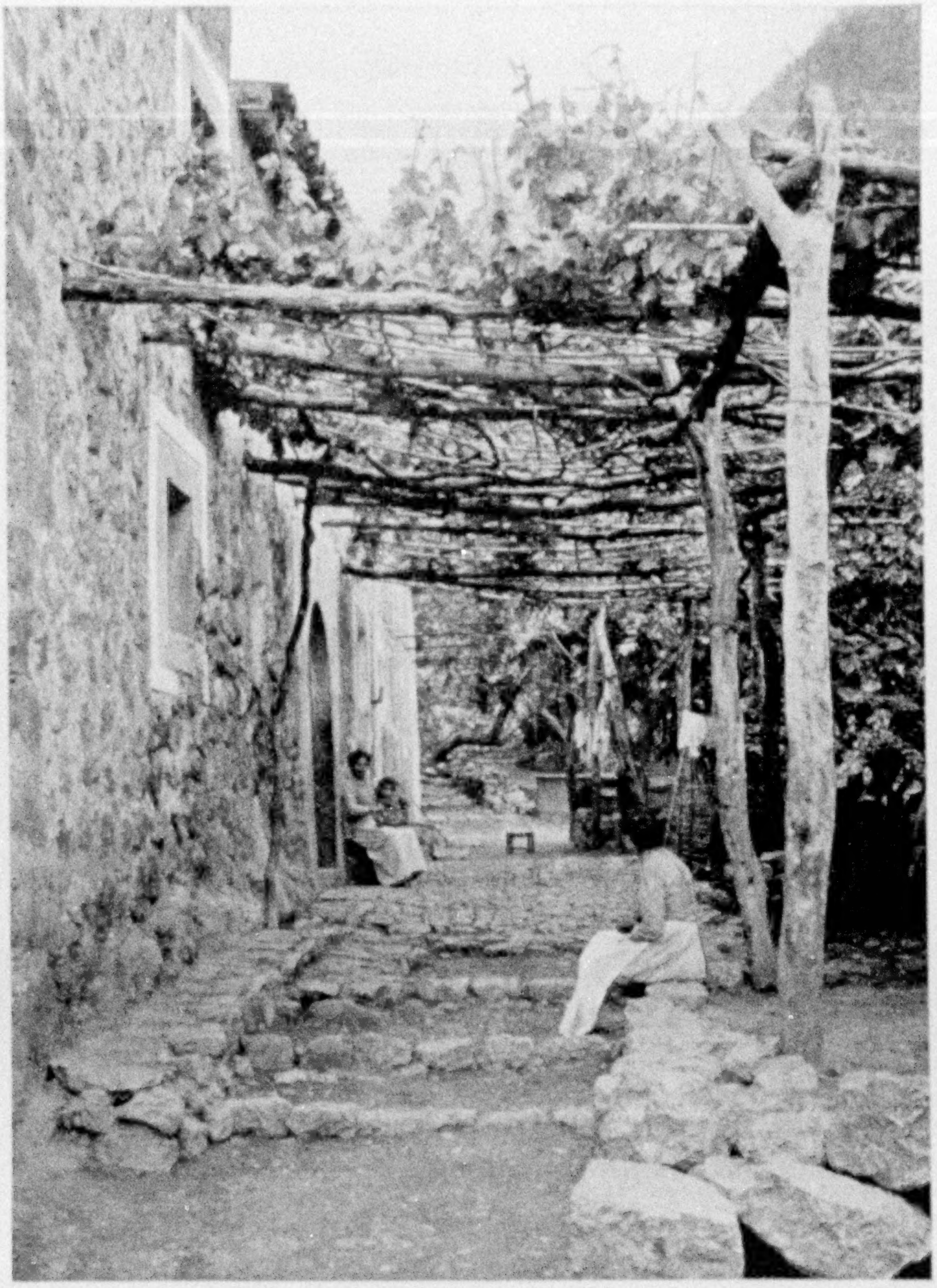
This beautiful thirteenth century building, rivaling the cathedral in antiquity, is the resting place of one of the most famous medieval heroes of the Balearic Islands—Ramón Lull, variously and successively described as a rake, a recluse, a scholar, a fanatic, and a saint.

the fingers, and while to cackle like a hen may not be dignified, at least it is effective for making one's self understood. Fruit was more difficult.

The little village store was the meeting place for the men. Everyone would leave his card game or glass of aniseed and gather respectfully in a circle while we made our signs and motions. Then a brilliant idea would occur to one, a hasty conference would ensue, and perhaps an onion would be brought out when we were signaling for apples; but in the end we always seemed to be understood, for all entered into the game with the same zest that we displayed.

In fact, we soon began to fancy ourselves exceptional linguists. One hot afternoon I remember that the boy of the party, as he sat out on the stone table under the arbor, made strenuous conversation with some peasant women. I say "strenuous" with reason. Such a running in and out—now for a dictionary or phrase book, now for a piece of string or some other "property," and during the interims wild gesticulations. Occasionally the performer was greeted with peals of laughter.

Finally my curiosity became greater than my desire for a siesta. I went out to discover the cause of the disturbance. "Well," the boy explained (and this despite the fact that scarcely any one has been to school; so reading and writing are dead subjects, let alone geography), "you see, I am just explaining to these people about the Equator." And he was equipped with all of two weeks' knowledge of Spanish!



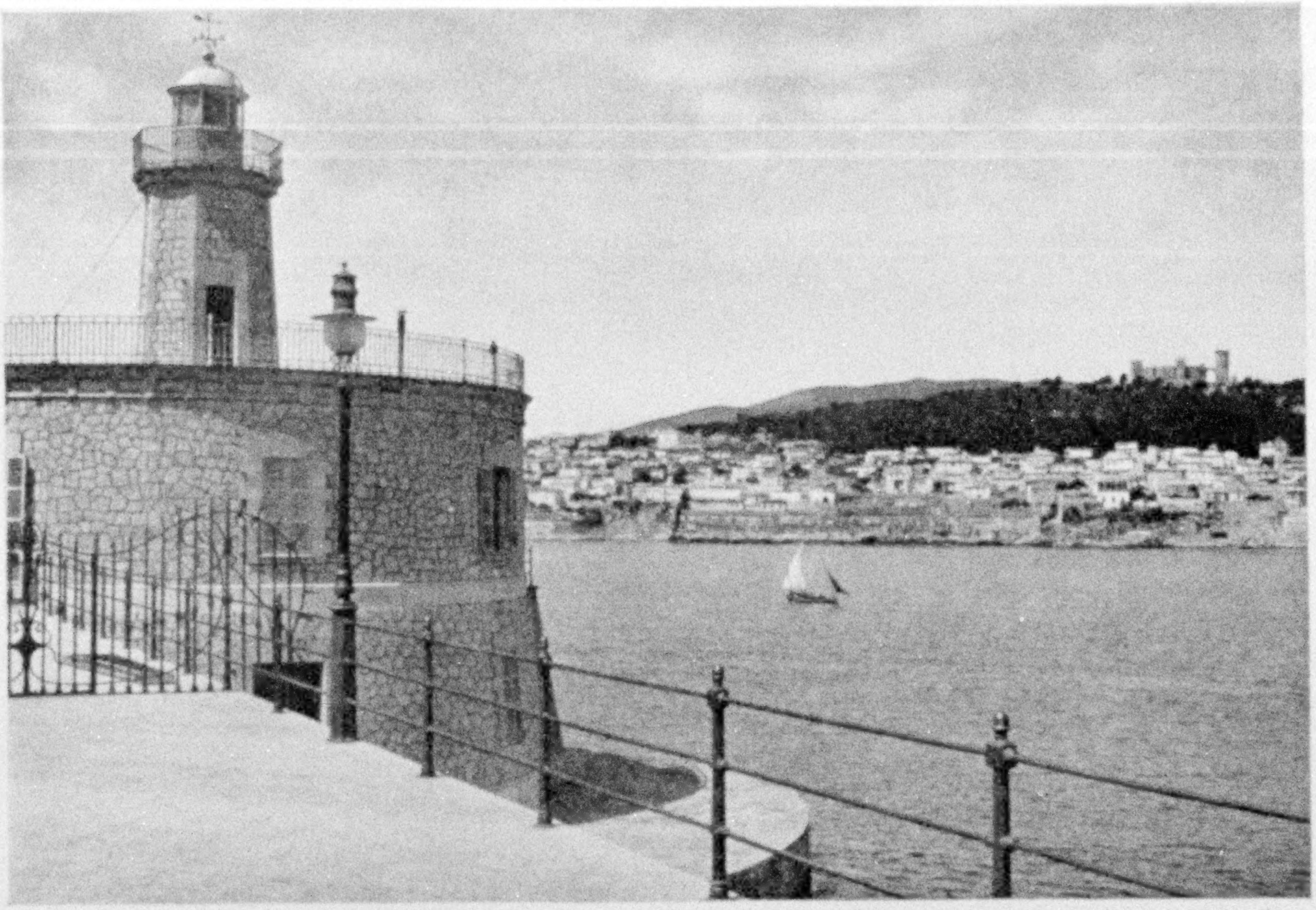
Photograph from Ernest Peterffy

ENTRANCE TO A DWELLING IN A MAJORCAN VILLAGE

But he was not to be discouraged. Within a few days of his teaching experience the boy went to Sóller. With pride he related how he had ordered four meat pies to be sent the next day by the diligencia. We all agreed that that was quite a remarkable feat. He explained at length just how it could be done.

Next day the diligencia stopped at the foot of the hill, but when Angela, the servant, came struggling up the path, laden with two huge tin boxes, we were surprised and later dismayed to find that twenty-two meat pies had arrived.

For days we fed meat pies to the family, the servant, all her friends and relations, and finally the pigs. However, we could not gainsay the fact that the boy



Photograph from Ernest Peterffy

THE LIGHTHOUSE AND PORT OF PALMA

In the distance is the bathing resort of El Terreno and on the hill stands the old royal castle Bellver, still well preserved after nearly seven centuries.

had ordered meat pies, and that they had arrived. The slight mistake as to number was a negligible factor.

EVERYBODY SHAVES ON SATURDAY NIGHT

On our first Sunday in Majorca we were surprised and not a little mystified at the apparent change in the character of the male population. We had arrived toward the end of the week, and a more murderous-looking set of individuals it would be hard to imagine. But on this day, when we went to the village, everyone seemed suddenly to have acquired benign characteristics. Even the *carabineros,* as they started out to guard the coast against smugglers, in spite of their dramatic costumes, with rifles over their shoulders, looked the simple, kindly fathers of families that they are.

Then we discovered the cause. Saturday night the entire male population is shaved, almost *en masse*, at the barber shop. It is curious how dark, heavy beards will alter an expression.

The barber incidentally is the leader of the band, the bootmaker, and the veterinary for the village. I remember that some time later the dance of the year was delayed because the musician's services were required at our house to attend our goat, which had chosen that inconvenient time to become violently ill. But the delay was nothing; the festivities continued with due ceremony later.

Such dances as they are! A platform is erected on one side of the open-air plaza, and there, under decorations of real flowers and incongruous gaudy tissue paper, the band sits in state.

The band, by the way, is composed of everyone who can blow a trumpet or beat a drum, ranging in age from seven to seventy, and in occupation from the road-mender to the *alcalde* (mayor).

Around the plaza, on improvised benches and kitchen chairs, sit the populace in their "best," under more paper decorations and many lanterns. The priests have disapproved of round dancing, but the native dances are not under the ban, and as these are so much more wildly picturesque than any of the modern variations, nothing is lost by the edict.

The plaza is the only flat space in the village, which is built on the steep side of the ravine, beside a gurgling stream. In addition to the old defense towers and ancient ruins of a castle on the side of a mountain, the village itself strongly reflects the influence of the Moors, who were driven out in 1232—quite a modern time in Majorca. There are still paintings on the houses done by the Moors before their spectacular exit, when they were conquered by James I (Jaime) of Aragon.

A historical beauty spot of the island is one of the two mammoth caves where 800 Moorish refugees, with their household belongings and herds, lived for two weeks while besieged by the Spaniards.

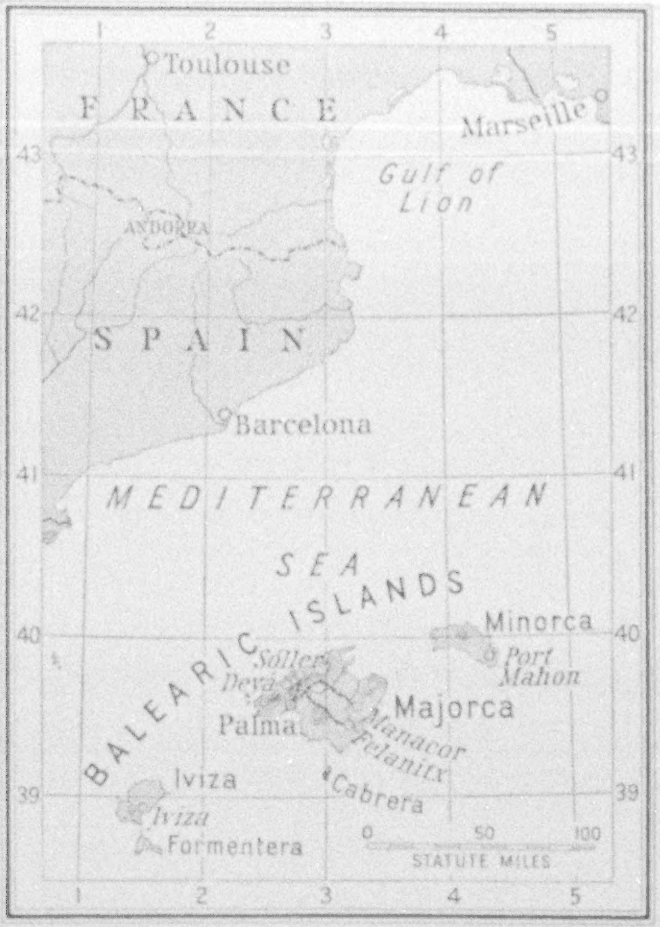
In the blackness of this cave one can imagine the weird shadows cast against the cathedral-like rocks by the torches of these refugees; for, unlike the cavern at Manacor, with its underground lakes and varicolored stalactites, this is somber and of uniform black and white.

The most lasting reminders of the Moorish menace are old defense towers, built to warn and protect the Majorcans from the piratical raids that seem to have been the chief sport of the Moors after their eviction. These still stand firmly in their commanding positions (see p. 424).

Our present house is built with one of the old towers as a starting point. Although the loopholes through the four-foot walls no longer serve as casements for bowmen, they are of great convenience as shelves for tooth paste and such articles.

The lookout tower is unnecessary when it comes to warning the countryside, nor is it particularly useful for pouring boiling oil on offending heads that come to besiege it; but a more charming sleeping porch would be hard to imagine, with its view of a semicircle of vividly colored mountains on one side and a deep gorge leading to the Mediterranean on the other.

The World War touched Majorca only slightly, although the natives complained even there of high prices. Sometimes I had to pay as much as four cents for a great plate of figs or tomatoes, where two cents would have served before! But, as we had so many gifts of fruit and vegetables in any case, the price somehow did not seem exorbitant.



Drawn by Charles E. Riddiford

A SKETCH MAP OF MAJORCA, BALEARIC ISLANDS

The German submarines profited by the prices and came often for supplies. We saw two from the balcony of our house during the first of our Majorca stays.

WHEN AN ARCHDUKE EARNED TWO CENTS

Some of the pro-German sentiment here was probably directly traceable to the former Archduke of Austria, who had something like eight big houses and owned the greater portion of the most beautiful northern part of the island, where pine-covered bluffs tumble with great spectacular cliffs into the sea (see page 427). It is difficult to imagine how he obtained the land. In that part of the island it is almost impossible to buy even a square foot of ground, for every plot is handed down from generation to generation and rented out in small holdings. At the Archduke's death his estate was inherited by the children of his secretary, a native of Deyá, so that the land has once more come back to its own.

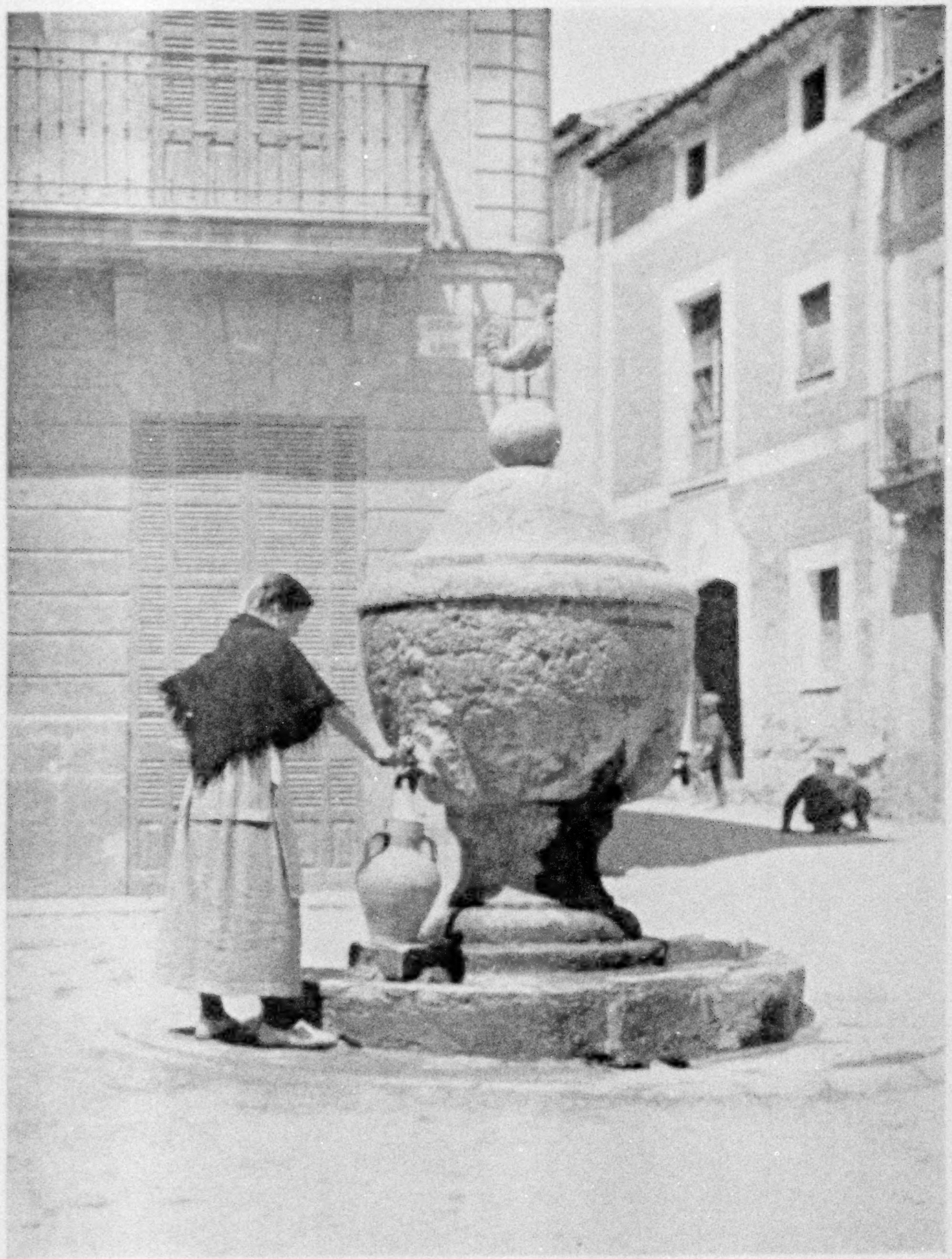
The Archduke seems to have been a very genial individual; he was certainly

Photograph from Phœbe Binney Harnden

A MAJORCAN GIRL WITH NATIVE POTTERY

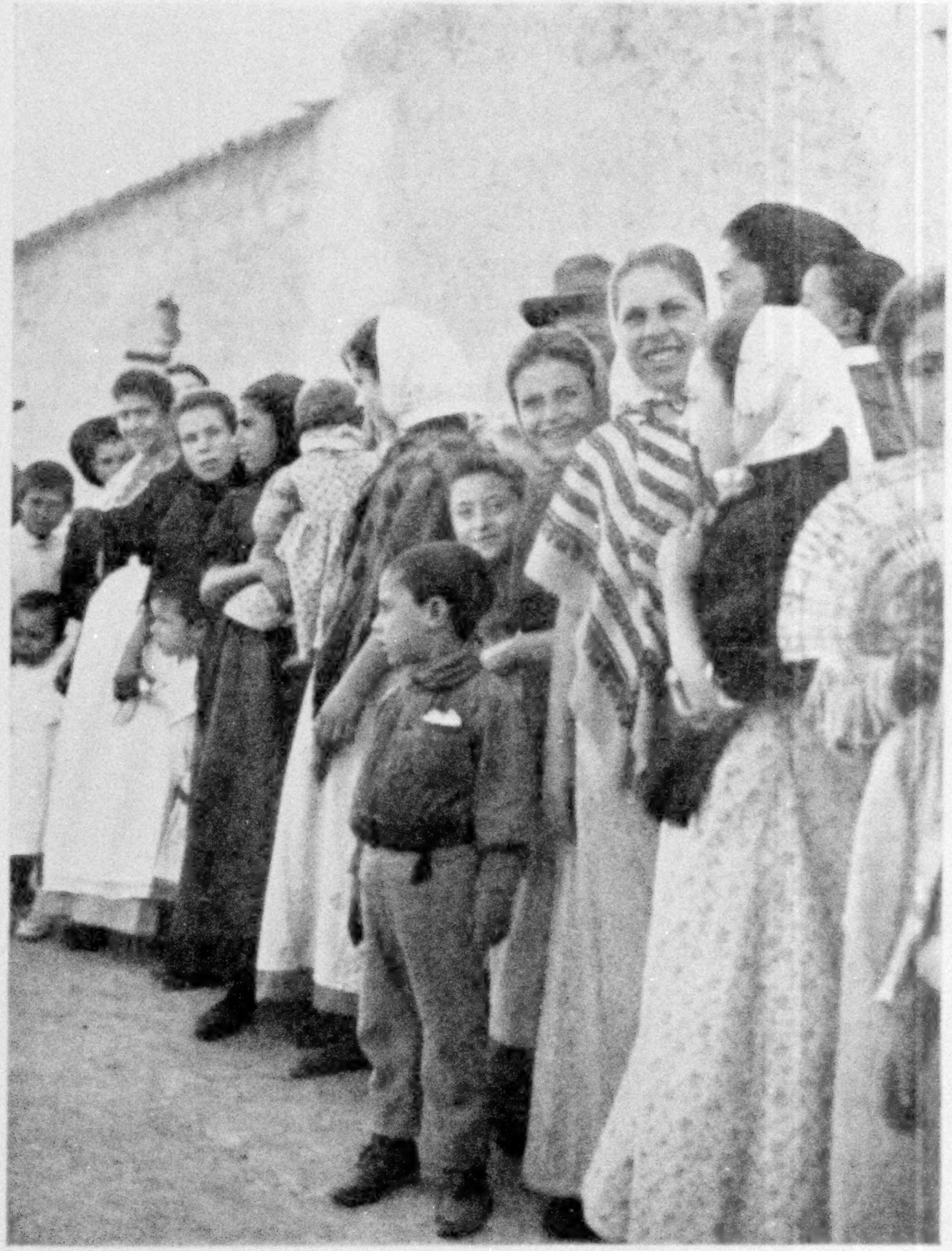
Photograph by L. Melano Rossi

INNKEEPERS AT POLLENSA—THE LANDLADY AND THE MAID



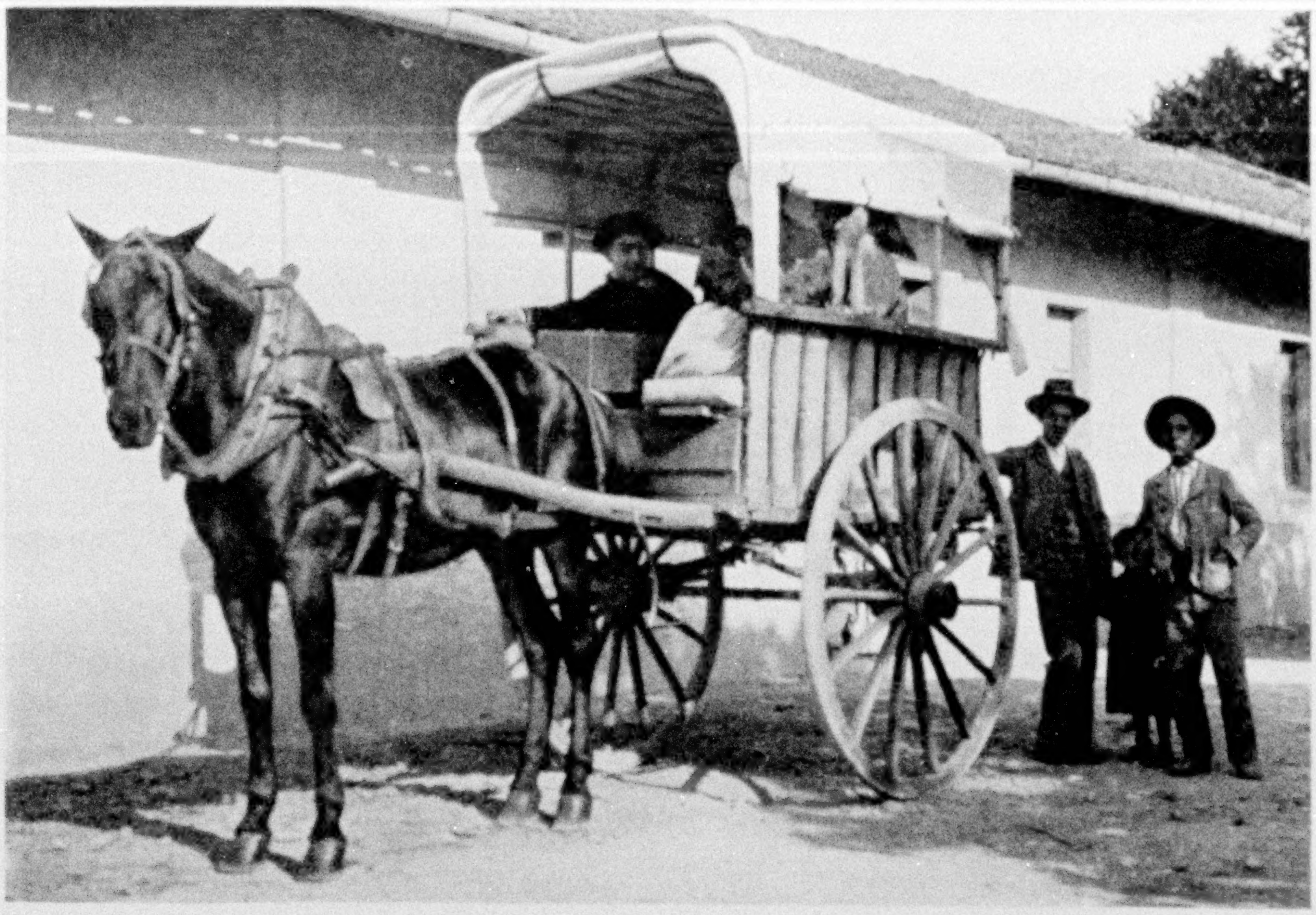
Photograph from Phœbe Binney Harnden

DRAWING WATER IN POLLENSA, A VILLAGE NEAR SÓLLER

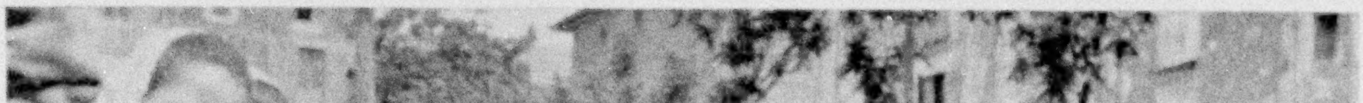


Photograph by L. Melano Rossi

GENIAL MAJORCANS



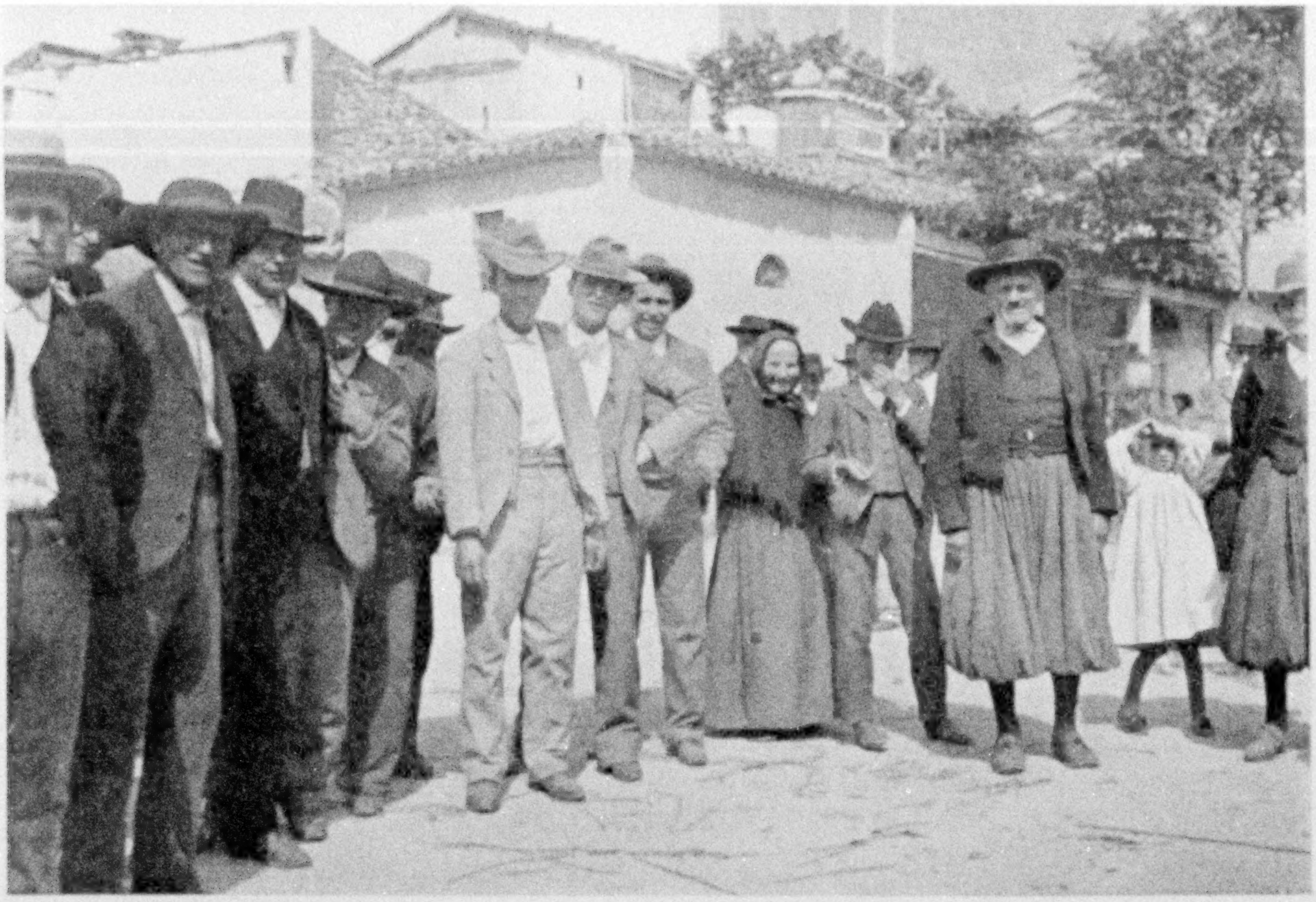
A TARTANA, THE FASHIONABLE CONVEYANCE OF MAJORCA



Photographs by L. Melano Rossi

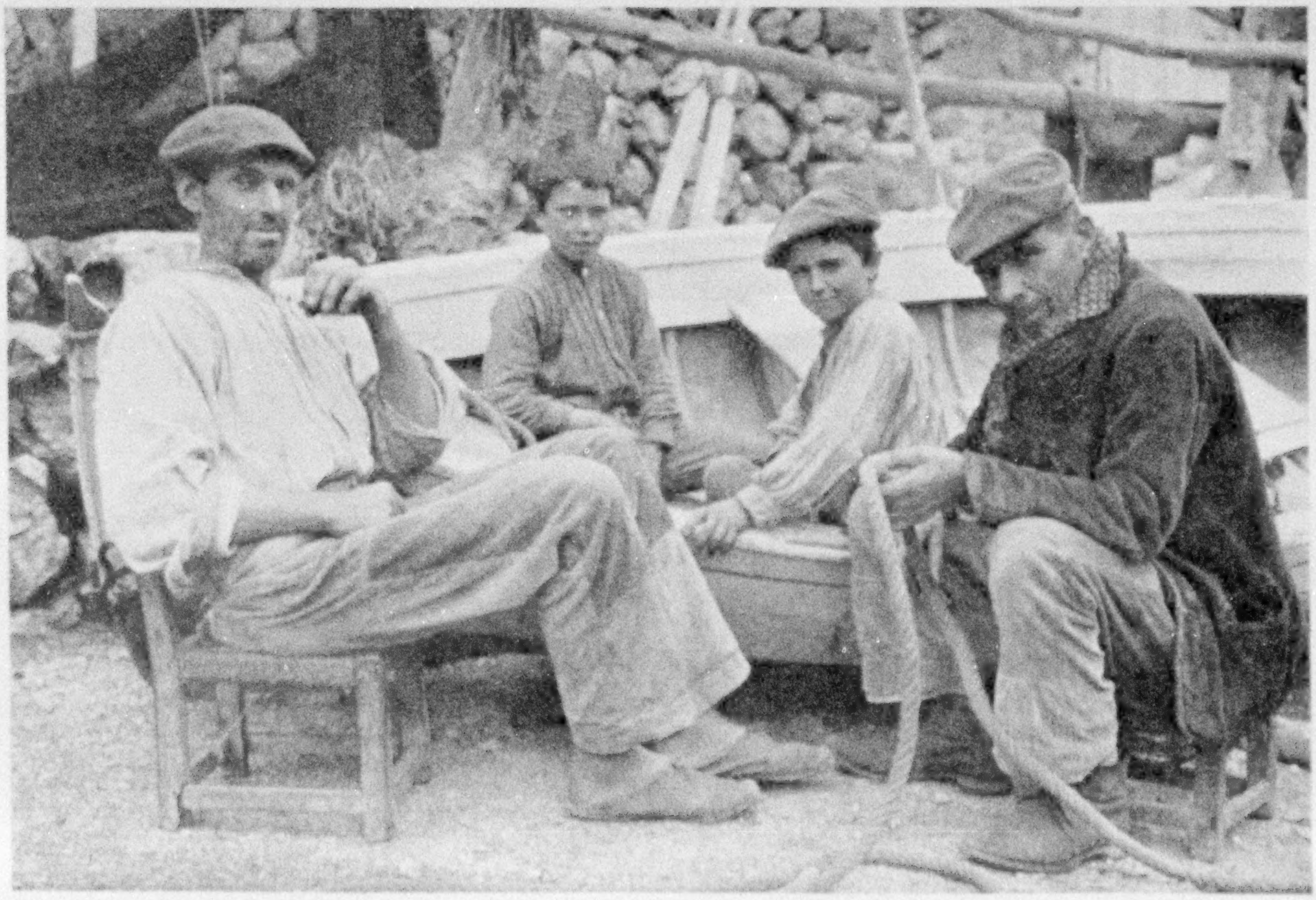
PIGS OF POLLENSA, RAISED FOR EXPORT TO BARCELONA

Cold storage is unknown in Palma. One writer declares that sheep and oxen are "killed, cut up, and sold almost before they have had time to cool."



Photograph by L. Melano Rossi

SUNDAY MORNING, AFTER CHURCH, IN PALMA



Photograph from Ernest Peterffy

FISHERMEN OF THE BALEARIC ISLANDS

These Majorcans live at Valldemosa, near Palma, in the shadow of a once famous Carthusian convent, in a cell of which the novelist George Sand lived during her sojourn on the islands.

Photograph from Herford Tynes Cowling

OLIVE TREES MORE THAN 1,000 YEARS OLD: MAJORCA

popular in Majorca, where they tell of his first trip to the islands when a young man. He was walking along the road when one of the peasants, now an old man in Deyá, had an accident with his loaded mulecart. The peasant called to the stranger and in none too careful language directed the Archduke's movements in aiding to repair the breakdown.

When the task was finished the obliging stranger was generously tendered ten *céntimos* (two cents), with the suggestion that he go get a drink. The Archduke thanked the peasant courteously, saying he would keep the coin as a memento, since it was the first money he had ever earned. The village still tells the joke and the peasant even now is made to feel embarrassed.

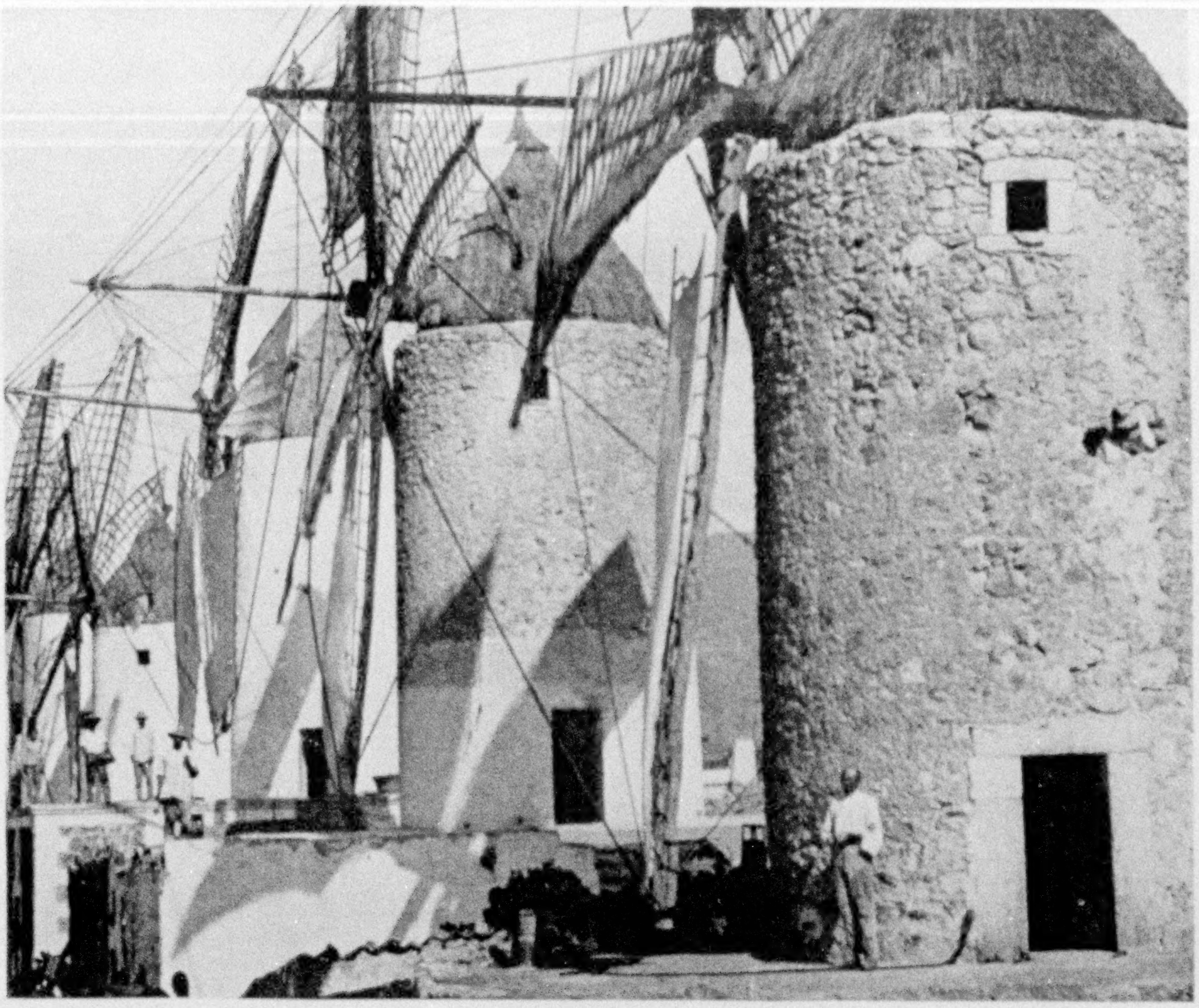
A SMUGGLERS' RENDEZVOUS

The supplying of the submarines was handled, so my neighbors told me, by a small society of men in Sóller (see page 424), about four miles northeast of Deyá. All the natural facilities aided them. For miles the coast is rocky, wild, and filled with caves—exactly the kind of caves for storybook smugglers.

The real smuggler still exists, though each night the carabineros, looking more like comic-opera figures than real-life guardians of the law, start for their all-night vigils along the coast. They are paid scandalously low wages, however, and the philosophical Majorcans shrug their shoulders and say, "What can you expect if they happen to fall asleep at convenient times and places, when the smuggler is free with gifts of money to his friends?"

Past our house goes a little donkey path to a cove on the sea, and sometimes in the dead of the night one can hear the tramp-tramp of many shod feet as they pass. Your neighbor will calmly tell you next morning that the *contrabandistas* were there in the night. On one occasion they probably needed rope, for they stole our donkey's reins; but, as some small, useful bit of cord is usually the extent of their iniquity, no one bothers them and they bother no one.

I have always longed to see them, for the winding path among the trees, with the background of wild, rugged mountains, is a setting for the smugglers, with their laden donkeys, upon which it would be hard to improve. But the nights are



Photograph by Dr. Franz Stoedtner

WINDMILLS ON THE ISLAND OF MAJORCA

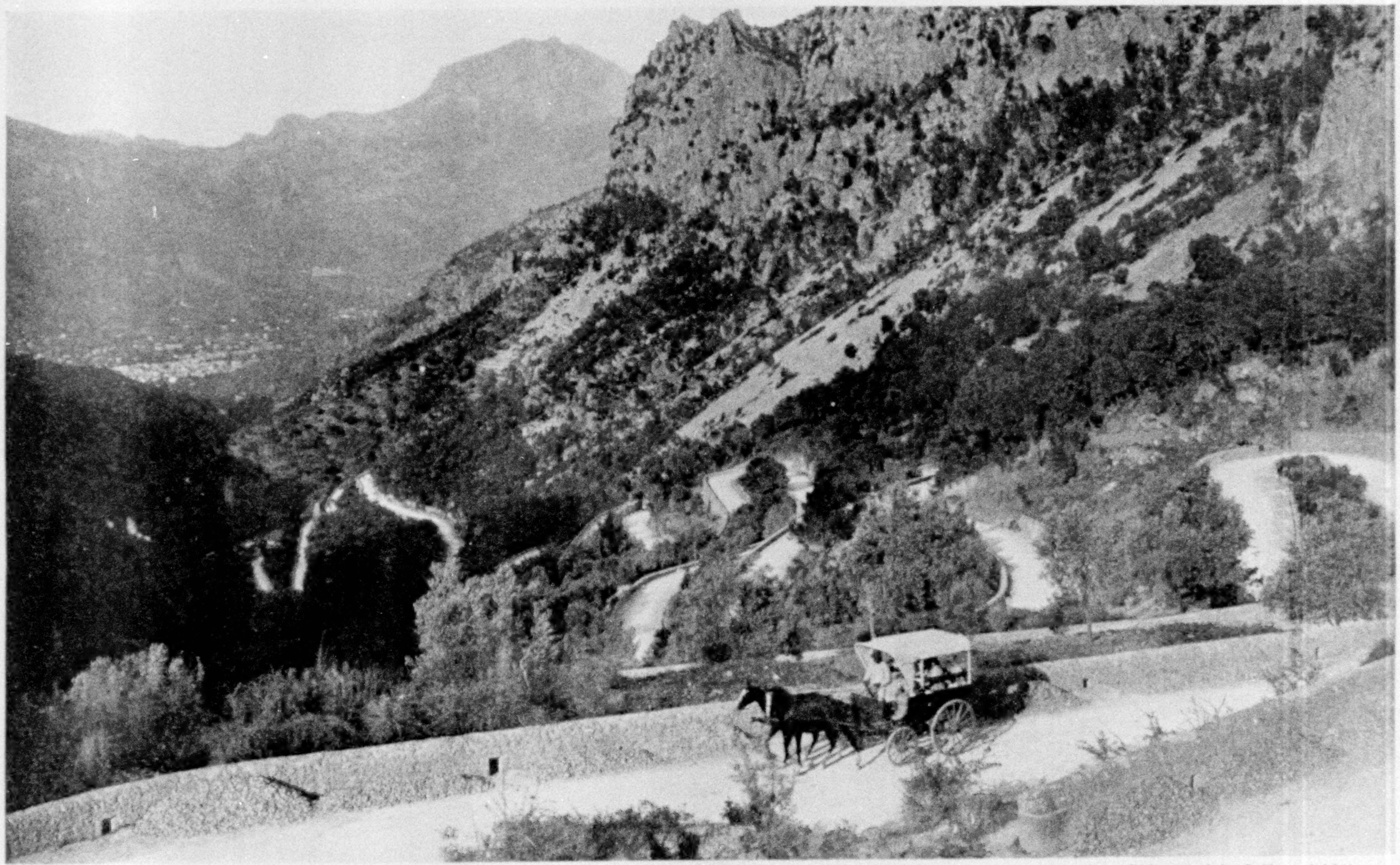
During the summer there is often great scarcity of water on Majorca, but, thanks to a system of irrigation introduced by the Moors, the rains of autumn and winter are stored in reservoirs. In the dry season the water is sold to landholders at a fixed rate. These windmills are in the olive oil district of the island.

dark and the shadows deep, and one can only hear—never see. I am told, however, that strenuous efforts are to be made against them, though when the boys bought contraband tobacco and then offered it to the carabineros for a smoke, no one seemed to think it anything more than an amusing incident.

The officers of the law are most diligent in prosecuting any other type of malefactor; but in Deyá crimes are few and far between. In 25 years only two people have occupied the little jail; one a man who came from another village and got drunk; and the other a woman of far from fair name, who thought she might, like Alexander, find new worlds to conquer. Word was sent ahead, warning Deyá of her arrival. A committee met her at the diligencia. She spent the night in jail and next morning was solemnly shipped back to Palma.

Recently a workman from another village stole a pair of shoes—and old shoes they were at that. The whole of Deyá was upset for two days; the unfortunate man was pursued for miles and finally caught.

Deyá is almost unconvincingly free from vice. There is practically no drunkenness. A diligencia driver and his family, who kept a wineshop, occasionally and unanimously got drunk on feast days; but they seemed to be the exception that proved the rule. Though there is no one very rich, there is no great poverty, and every one lends a helping hand to the families of the wandering carabineros, whose pay is small and, as is usual the world over, whose families are large.



Photograph by J. Truyol é hijo

THE HIGHROAD TO SÓLLER (SEE ALSO PAGE 424)

In the background is the Puig Mayor (pronounced pootch), the highest mountain on the island of Majorca, 4,740 feet. Sóller, a town of 10,000 inhabitants, nestles in a valley surrounded by orange groves. Its chief industry is the manufacture of majolica, the pottery which is said to derive its name from the island.

There is no servant class. The girl who worked for us in that capacity for all of 20 cents a day was a relative of the alcalde. She treated us as her friends. She has helped us now a good many years, but always with that acknowledged status.

But no one needs servants in Deyá. Everyone is busy, though for the women the actual housework is simple. There are no carpets on the stone floors. The walls and ceilings are whitewashed and, incidentally, whitewashed often, for everything is scrupulously clean, though insanitary. Next to the well-scrubbed and whitewashed kitchen, there is the invariable pigsty.

THE KILLING OF THE PIG IS A BIG FAMILY EVENT

The pig plays a dual rôle in Majorcan villages. He is the general scavenger, and later can be killed and made into the red-and-black sausages that are hung on strings beside the dried tomatoes and peppers in the attic as a supply for the winter.

The killing of the family pig is one of the big events of the year. Although I have never quite come to the point of accepting the kind invitations of my friends to be there at the finish, the performance can be heard plainly enough to satisfy any bloodthirsty tendencies I might have. The relatives, family, and friends gather and all help to convert their erstwhile companion into such forms as are practical for winter food.

The meals are simple; for breakfast, coffee with bread and oil; luncheon, a variation of their many *sopas*, a dish of vegetables fried in oil, to which water is added, and finally the fluid soaked up with slices of their saltless brown bread; for supper, again sopa. Often there is sopa three times a day, accompanied by a dish of home-cured olives, small and rather bitter. The olive oil is of home production, made by primitive and picturesque methods. Under our house is one of the great olive presses, looking as though Brangwyn had drawn it to order.

The bread is baked in great community ovens. Olive branches are put in and burned until the oven is hot, then the coals are raked out, and after three prayers are said and the sign of the cross made, the bread and various fancy pies—rich bread crust covered with vegetables and slices of red sausage and sprinkled sugar—are put in.

Meals, when there is any regularity, are eaten in the low-ceilinged, whitewashed kitchens, in which there is usually built a second windowless inclosure with a low roof, where the family gather around an open pan of burning charcoal during the winter.

There are practically no wood-burning stoves; all the cooking and heating is done with open charcoal fires. To be sure, in our house we have a little oven built in next to the open burner, on the tiles. But, then, we are very modern.

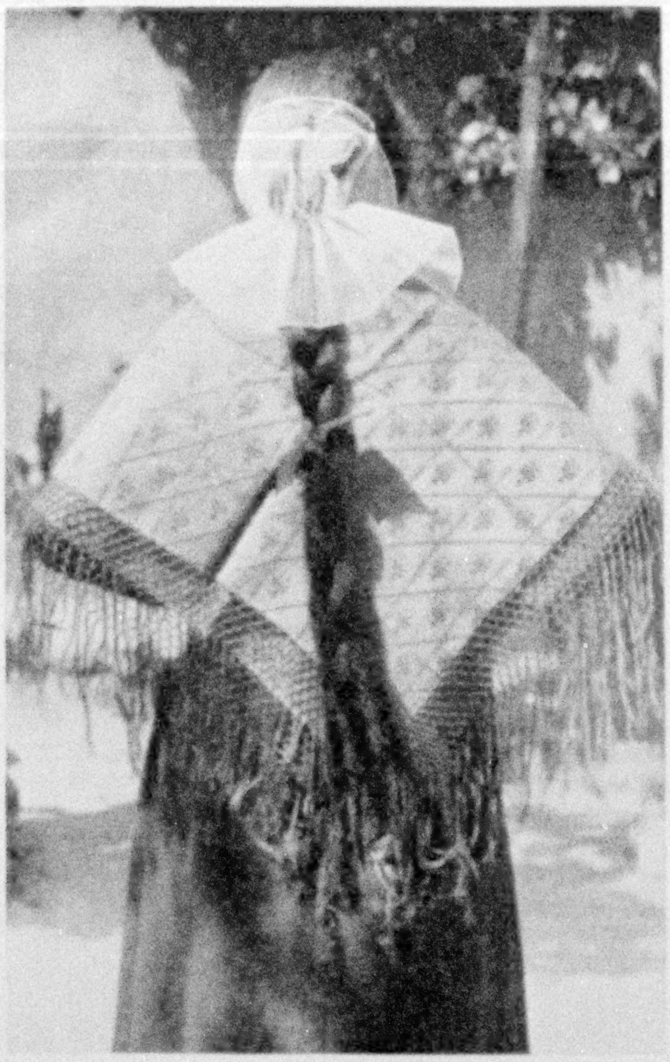
We also have running hot water. Mention must be made of the fact, however, that all the water has to be carried up in *cántaros* and put into the *depósito* before it will run down. That is a mere detail. The entire village called the first two days we moved in, and each and every individual stolidly stuck his or her finger under the faucet to make doubly sure that it ran and that it was hot.

We also have the only piano in the village. When we brought it down the road, a circus procession could hardly have caused more commotion. The children sighted us first and passed the good word along; so that by the time it arrived at the house, there was a crowd waiting to help move it in, though only two were required.

There was hardly enough room on the case for the number of helping hands. Only when it was pushed down the narrow passage, and there was positively room for but one man, did any of them let go. I am afraid the piano, which every caller respectfully touched, and the running water were the chief causes of our excessive popularity in those early days.

PREPARATIONS FOR MARRIAGE BEGIN IN EARLY CHILDHOOD

Sunday is the great day for visiting; also it is the time for walking up and down the road in groups. The system of chaperonage is very strict. The girls never go out alone, nor after dark, and will frankly tell you that they must be very careful or they will never be married.



Photograph by Herford Tynes Cowling

A MAJORCAN COSTUME

A pigtail and the *rebozilla*, or head-handkerchief, are gradually disappearing at the instance of Majorcan girls who return to the island after a sojourn in France.

For that event they begin preparing in extreme youth. I have known a trousseau to consist of as many as a dozen dozens of everything. Imagine 144 night dresses, not to mention any of the other "unmentionables"!

The household linen is lovely. One may be sure of good sheets, nearly always embroidered or with open work, and a carefully made-over mattress, even in the little *fondas*, or boarding houses, where one pays 20 cents a day for a room (the board according to what you eat).

In Majorca it is an exceedingly bad housekeeper who does not have her mattress made over, whipped, and aired in the sun at least once a year.

Most of the work is done out of doors—raising vegetables, often on a bit of land some distance from the house, tending the orange or lemon crop, picking up olives, etc.

At sunset one does not wonder that this is called the Paradise for Painters, as the quaint figures, with their donkeys and goats, wend their way home from the day's work laden with bright-colored fruits and vegetables, or carrying great bundles of olive branches for fuel; the women wearing full, bright-red petticoats, which are always displayed to view, the outside skirts being drawn up around the hips for protection.

On the heads of the older women are silk handkerchiefs; on the younger sheer white caps as headdresses, the hair being worn in one long braid down the back.

THE FAMILY TURKEY IS TAKEN FOR A DAILY STROLL

Around Christmas time, to the family goat, donkey, and pig is added the family turkey. It seems to be the fashion to buy early, not so much to avoid the rush as to compare and show off this worldly possession.

In Palma, where there are real sidewalks, the family turkey is tied with a string to the front door, but at least once a day it is taken for a walk with the end of the string still tied to its leg. Sometimes it is carried, whether from fatigue of the bird or affection of the owner, I do not know. At any rate, the fortunate individual seems to get his money's worth from the turkey before it is led to slaughter.

Books could be written on Palma, Alcudia, and on Valldemosa, where George Sand and Chopin spent many happy days.

Despite George Sand's comment to the contrary, a more simple, kindly, frugal people would be hard to imagine.

At present, Deyá de Majorca is almost unbelievably ideal, as it lies surrounded by its rugged futurist-colored mountains, overlooking the blue of the Mediterranean. In these days of strenuous effort, it is a haven of tranquil beauty surrounded by people of kindly simplicity. And those who do not need the "madding crowd," can say, as said the uncommunicative man on board the boat for Ceylon, "Why the forty miles?"

SAKURAJIMA, JAPAN'S GREATEST VOLCANIC ERUPTION

A Convulsion of Nature Whose Ravages Were Minimized by Scientific Knowledge, Compared with the Terrors and Destruction of the Recent Tokyo Earthquake

By T. A. Jaggar

Director, Hawaiian Volcano Observatory

TWO of the greatest convulsions of the earth's surface in the history of mankind have occurred in Japan during the present generation.

The earthquake of last September destroyed 400,000 lives and wiped out billions of dollars' worth of property; the Sakurajima volcanic eruption of 1914 (the greatest in the annals of the Island Empire) resulted in the loss of only 35 lives and some millions of dollars in property.

Scientific investigation is, in large measure, to be credited with the relatively few casualties in the latter instance, for it was through the prediction of the imminence of the Sakurajima outbreak that the inhabitants of a populous district were enabled to flee from the wrath about to come. In Tokyo, on the other hand, the cataclysm of earthquake and succeeding flames caught the great Japanese metropolis of two million people and its adjacent seaport unawares and unprepared.

It was through a study of premonitory earthquakes in their relation to volcanic outbreaks that the Sakurajima eruption was definitely predicted; conversely, it is hoped that, in time, through exhaustive study of volcanic activities, earthquakes may be predicted with accuracy. If such forecasting can be achieved, it is conceivable that an earthquake of the severity of the Tokyo disturbance could occur with a loss of life and property almost negligible in comparison with what actually happened in September, 1923.

The phenomena of the Sakurajima eruption, therefore, are proving of transcendent importance to the scientific world, and the measures which were taken to safeguard life at that time are being eagerly studied anew.

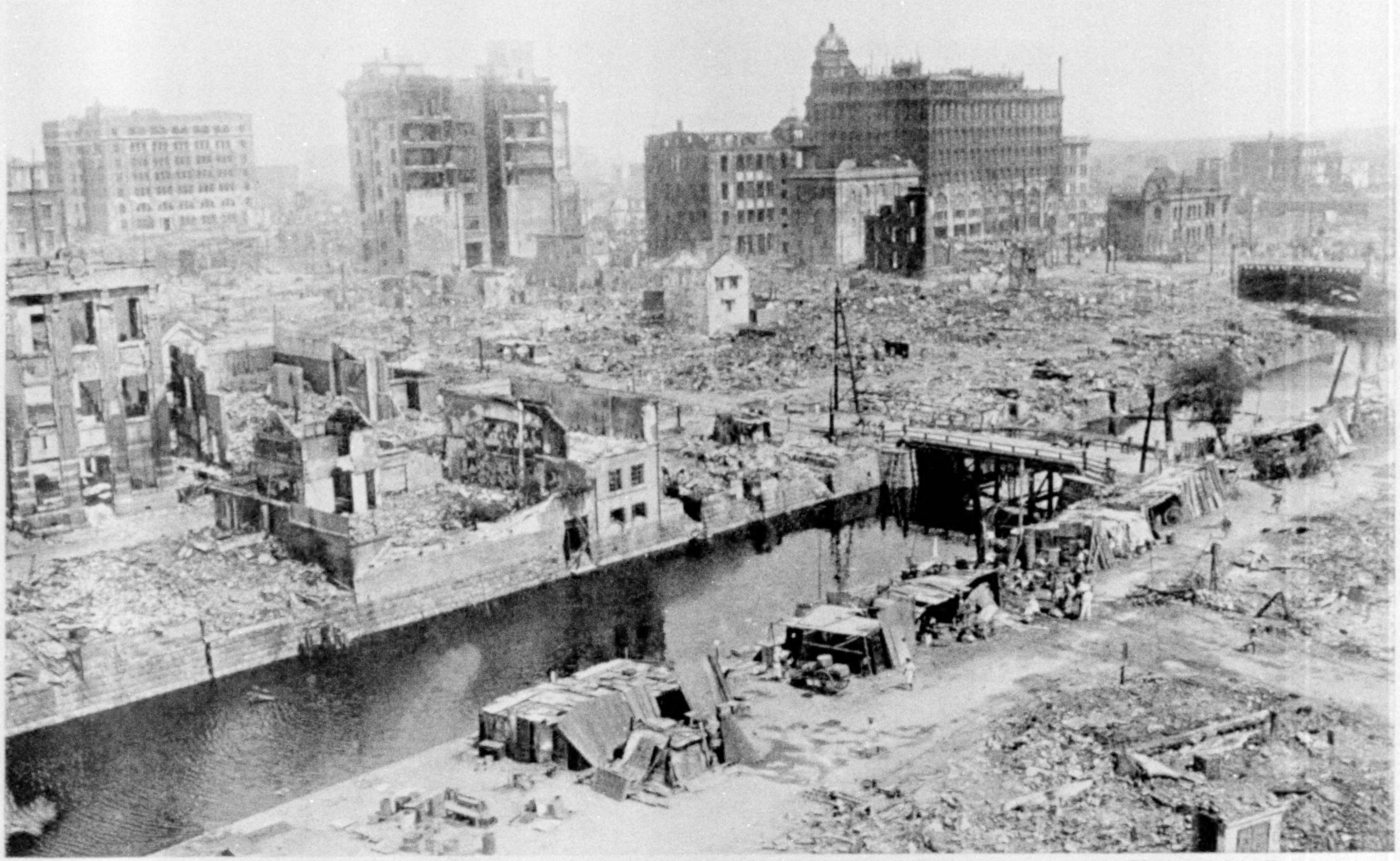
The volcano of Sakurajima, shaped much like Vesuvius, rises to a height of 3,506 feet, directly opposite the city of Kagoshima, in Kagoshima Bay—a tongue of water extending some fifty miles into the southern end of Kyushu, the most southerly of the four main islands of the Japanese Archipelago (see page 449). Growths of young pine trees mark the course of old lava flows from the two main craters of the summit.

KAGOSHIMA'S FATE FORESEEN BY SCIENTISTS

Prior to the eruption of 1914, eighteen villages, with an aggregate population of 22,000 industrious farmers and fisherfolk, nestled on the shores of this small volcanic island, which nearly filled the bay between Kagoshima and the Osumi promontory. The channel between the volcano and the city was barely two and one-half miles wide, with a depth of from nineteen to seventy fathoms, while that on the Osumi side was only one-third of a mile wide, with an average depth of more than fifty fathoms.

Kagoshima, the thriving capital city of the province, with a population of 70,000, is the center of Satsuma pottery manufacture and of a fertile farming region, producing tobacco, citrus fruit, and sugar cane (see pages 450, 451, and 454).

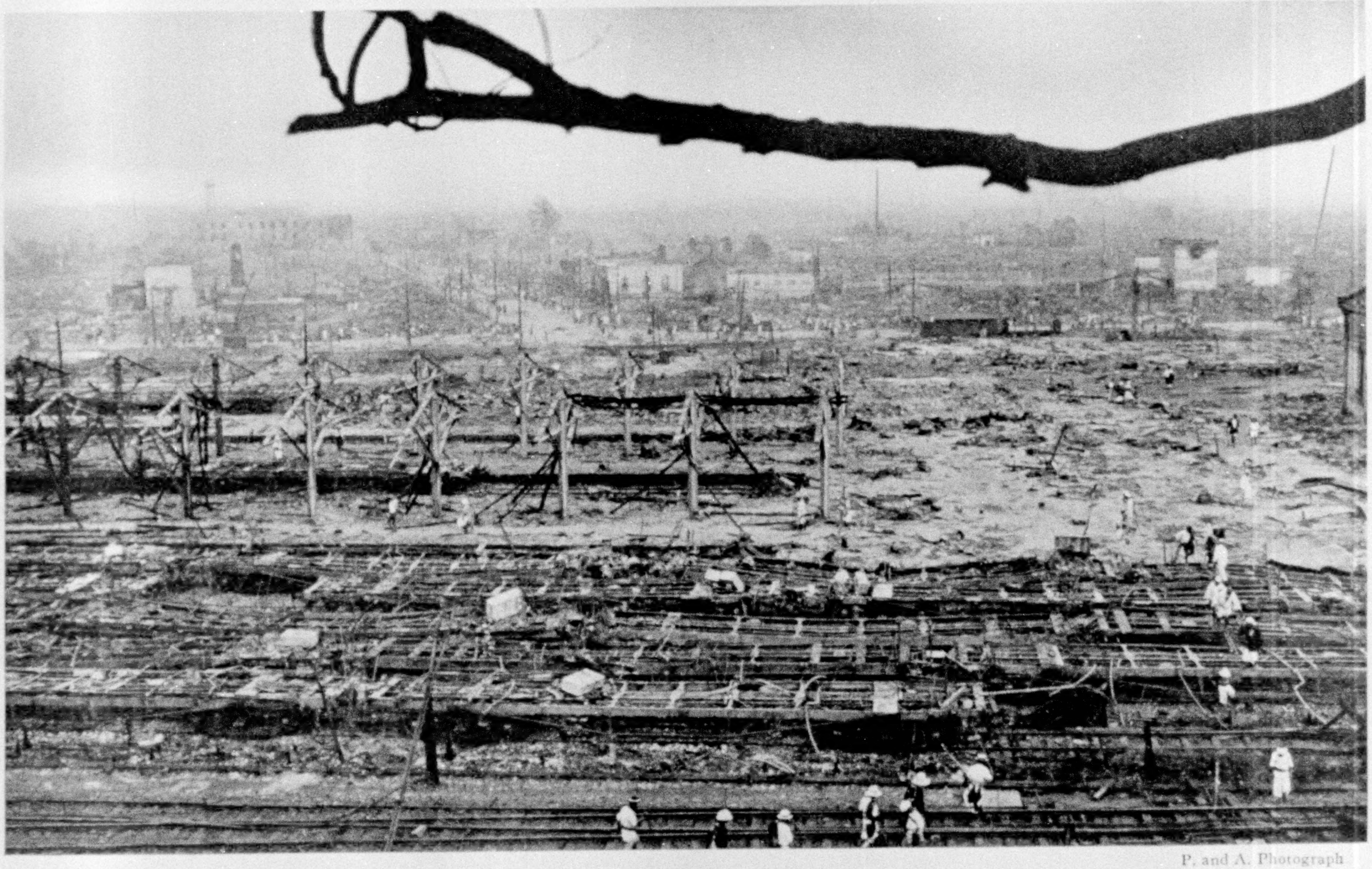
Men of science had long known what lay in store for Kagoshima. Experience had taught observers that when "swarms" of earthquakes begin in the vicinity of an active volcano, the underground dragon is writhing and preparing to make trouble.



Photograph from T. A. Jaggar

THE BUSINESS SECTION OF TOKYO AFTER THE EARTHQUAKE

This photograph shows in the foreground, by the side of a canal crossing the city, the new shacks occupied by refugees, a go-down, or "safe-house," in the middle distance, and the Mitsukoshi department store (with turret). Most of the buildings that resisted the quake were gutted by fire. Thousands of parked automobiles contributed their gasoline to the flames. The property loss to the nation has been estimated at more than five billion dollars.



P. and A. Photograph

WHERE A TOKYO RAILROAD STATION ONCE STOOD: AMID THESE BLACKENED RUINS NEW BUILDINGS ARE ALREADY RISING

P. and A. Photograph

THE FIRST FIRE AFTER THE TOKYO SHOCK: METROPOLITAN POLICE HEADQUARTERS

In 1909 and 1910 two writers published warnings that Sakurajima was likely to erupt explosively after violent premonitory earthquakes.

For three years prior to 1914 volcanic eruptions had occurred in all parts of Japan, and Dr. F. Omori, the noted Japanese seismologist, was confident that a disaster of major proportions was impending. He planned an observation trip to Kirishima volcano, thirty miles north of Kagoshima.

The observatory at Kagoshima had recorded 91 earthquakes in 1913, as compared with an average of 34 quakes annually over a period of years. The greatest of the 1913 shocks occurred on June 30 and did some damage. Most of the disturbances were felt more strongly on the island of Sakurajima itself than in Kagoshima city.

At Yoshino, to the north of Kagoshima, springs suddenly ceased to flow in the autumn of 1913, and a pond and several wells in the city went dry. Yoshino proved to be exactly in the line of the fracture athwart the volcano to the east, where the eruption of the craters subsequently developed.

The rainfall during 1913 at Kagoshima had been unusually light, as had been the case ten years and twenty years previously, each of those dry years having been followed by some activity in one or more of the volcanoes on the island of Kyushu.

VIOLENT PREMONITORY ERUPTIONS BEGAN AT NEAR-BY VOLCANO

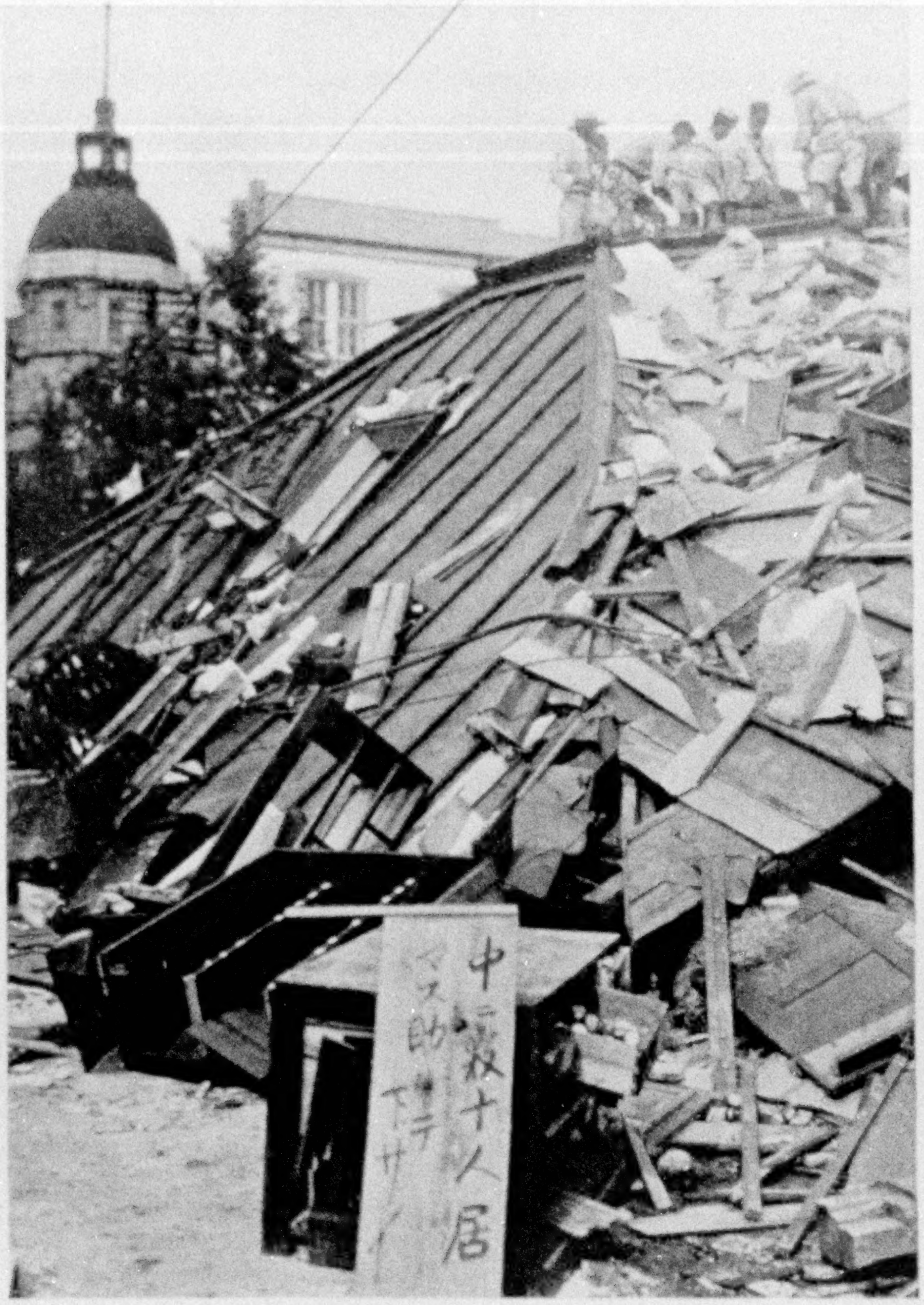
Violent eruptions began in 1913, not at Sakurajima, but on Kirishima, where there were three outbursts, the last two being on November 8 and December 9 (see illustration, page 455). Naturally, as January 9, 1914, approached, the inhabitants in the vicinity of Kirishima became extremely apprehensive; but that volcano remained ominously quiet.

On Sakurajima, however, earthquakes began to occur in "swarms" and people began to jump. Three strong shocks were felt on the afternoon of January 10, followed in the evening by two more. The next morning there were three strong shocks, accompanied by rumblings, before sunrise.

The earthquakes now became increasingly alarming. Growling noises preceded some and a roaring, as of escaping gas under pressure, followed others.

Ten strong shocks were counted during January 11, and scores of earthquakes were being registered by the seismograph at the meteorological observatory on the cliff west of Kagoshima—five shocks per hour during the morning, eleven per hour about noon, and some twenty per hour in the evening, with a maximum of twenty-eight between 8 and 9 p. m.

There was a lull in the quaking after midnight, but on January 12 twenty shocks per hour were felt from 3 to 11 a. m., at which time the eruption had relieved the stress and the number diminished.



P. and A. Photograph

"HELP!"

On the plank in front of this crashed house some one scrawled, "Here are several ten men under the roof. Do please save them."

417 QUAKES IN 30 HOURS

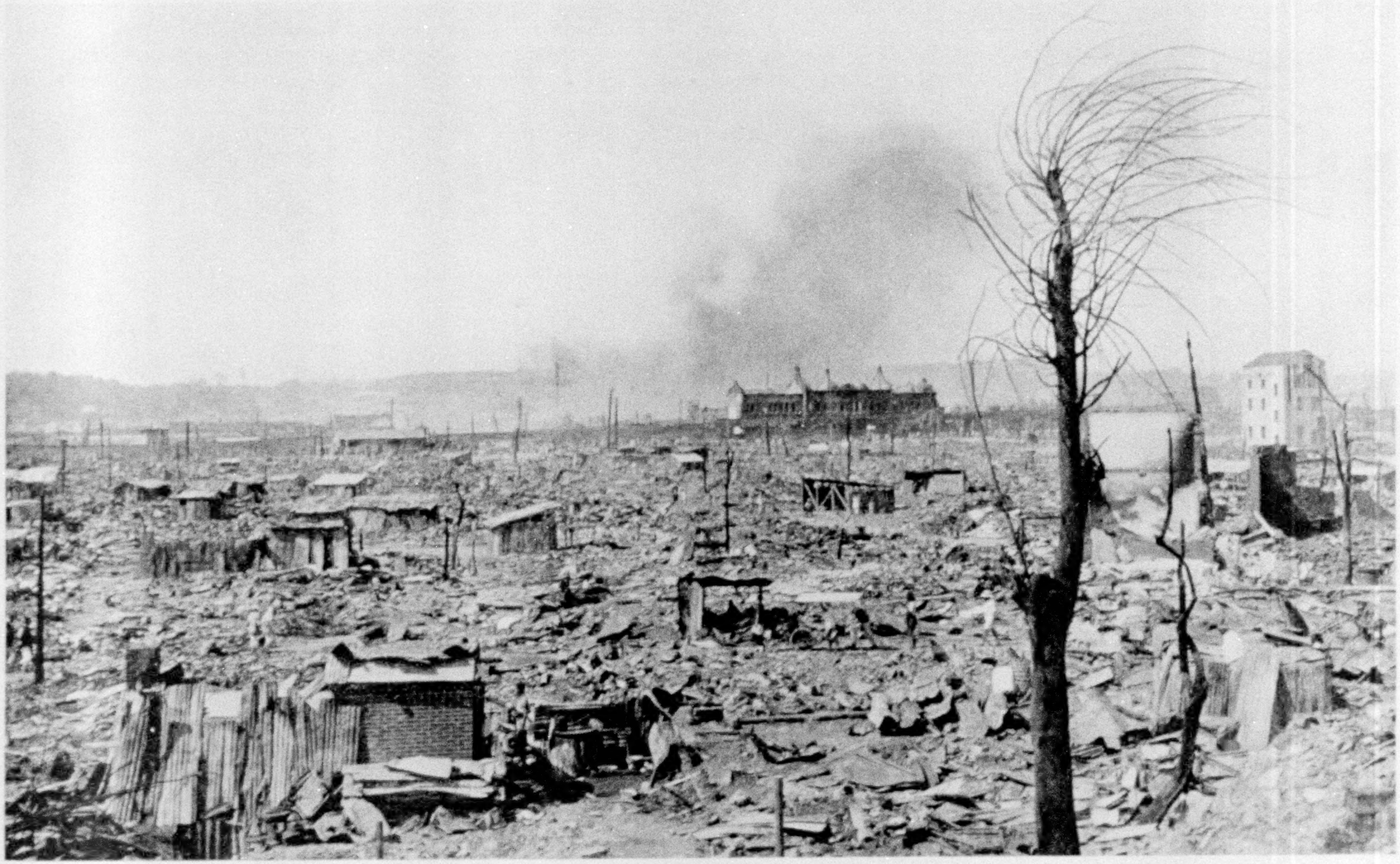
The number of earthquakes felt in the city indicates that from 6 p. m. until midnight, January 11, shocks, accompanied by rumblings, were felt approximately every twenty minutes; from midnight to 3 a. m. of January 12 every ten minutes, and thereafter, until 5 a. m., every five minutes. Then came a respite from strongly felt shocks for about three hours, during which period there were five quakes at very irregular times.

Four hundred seventeen earthquakes were thus recorded at Kagoshima between 4 a. m., January 11, and 10 a. m. January 12, after which the main eruption of Sakurajima began. Counting the shocks of the 10th, which had begun about 1 p. m., there was immediate forewarning in noises and shakes for forty-five hours prior to the explosion.

These warnings were heeded. Every available sampan sculled with frantic speed back and forth across the channel all day Sunday, January 11, moving the natives of the island, their bedding, mats, rice bags, and canary birds, to the mainland. By Monday the army, navy, and other government departments, railways and steamship lines were all helping. Sunday afternoon, about 2 o'clock, during a period of violent quaking, a report came from Tarumi, southeast of Sakurajima, that white smoke was seen rising from the middle of the volcano.

THE SAKURAJIMA OUTBREAK

The Monday period of seismic activity was strikingly terminated and relieved by the volcanic outbreak of 10 o'clock.



P. and A. Photograph

A BIRD'S-EYE VIEW OF YOKOHAMA AFTER THE EARTHQUAKE OF SEPTEMBER, 1923

The most destructive earthquake in the history of man began about noon, on September 1, in the neighborhood of Tokyo and Yokohama, entirely destroying the latter city and about 70 per cent of the capital. Fires spread rapidly. The water mains being broken, little could be done to check the flames.

Sakurajima in the early morning had been veiled by a cloud, but the incessant din of rumbling diminished after 5 a. m. There may have been a summit landslip. Continual quick explosions were heard from 9 o'clock on, and a small puff of white vapor was reported at that time; but it was not until 10 o'clock, when all the fog clouds were dissipated, that the great volcanic drama unfolded under splendid photographic illumination.

The climax came at 10:05, when, in the middle of the side of the mountain toward Kagoshima, the awe-stricken people saw the hard profile of a swelling balloon of black smoke rise majestically from the ground where, an hour before, were orange orchards, terraced fields of sugar cane, and gardens of radishes (see pages 452 and 454).

The peasants rubbed their eyes; the children in the schools ran to the windows to look. They were instantly dismissed.

One of the most naïve descriptions of the scene has been furnished by a Japanese boy of fourteen, a student of English in the language class of an American teacher in the high school at Kagoshima. He wrote: "Monster rocks went horizontally from the down to the up, with smokes on their behind."

The jet of smoke from the western vent of the volcano shot up obliquely, then straightened to a vertical column, and rose 30,000 feet into the sky, first club-shaped, then assuming the form of a great lily. Finally, the top bent majestically eastward, like a triumphal arch built to span a mountain. The upper volutes of dust were caught by some countercurrents of wind, which strewed the powder all over central Japan.

Ten minutes after the first outbreak a similar cauliflower column rose from the east flank of the volcano, but this was dwarfed by the towering western shaft with which it eventually merged.

With occasional lulls, but with ever-increasing violence, the booming concussions of the eruption grew more and more terrible. Flashes of lightning danced through the great billows of smoke and dust (see illustration, page 457), and, in the lower portion of the great, black column, vertical lines of upward streaming rocks, bombs, sand, and smoke, curling as high as the mountain itself, could be seen from time to time. In addition, there were outward spurts of large, glowing blocks, which left curving trails of vapor in their path. At night these red-hot missiles could be seen to darken after passing the crest of their curved courses, and gradually they were blotted out by the darkness.

The fall of ash over the city of Kagoshima began an hour and ten minutes after the eruption started, and continued intermittently until the following evening (see page 463). At 5 o'clock in the afternoon the eruption waxed in fury. Extra-heavy earthquakes in the vicinity of Arimura, on the southeast coast of Sakurajima Island (see page 454) were felt, and ships in the bay reported that the maximum height of ejection of material was reached an hour later.

EARTHQUAKE CAUSES ONLY LOSS OF LIFE

The crisis, which resulted in the only loss of life during the disaster, occurred at 6:29, when a terrific earthquake threw down walls and buildings at Kagoshima, dislodged boulders from cliffs, and interrupted railway and telegraph services.

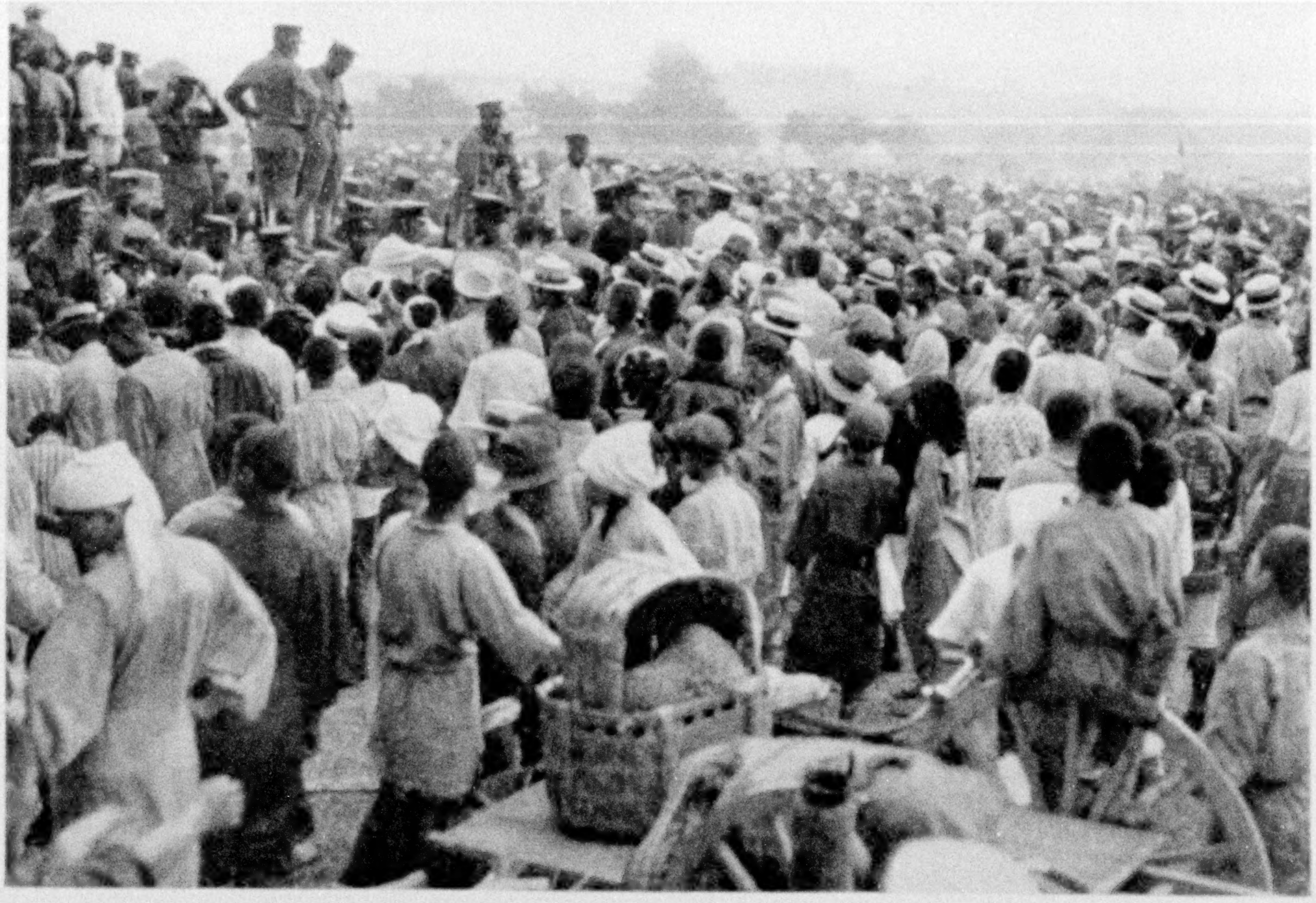
Fugitives were trapped in landslides, and a tidal wave, with a ten-foot swing, caused serious damage to small boats in the harbor. Thirty-five persons were crushed to death and 112 were injured.

This quake is to be classed as a "world shaker," for it was recorded on seismographs in Europe.

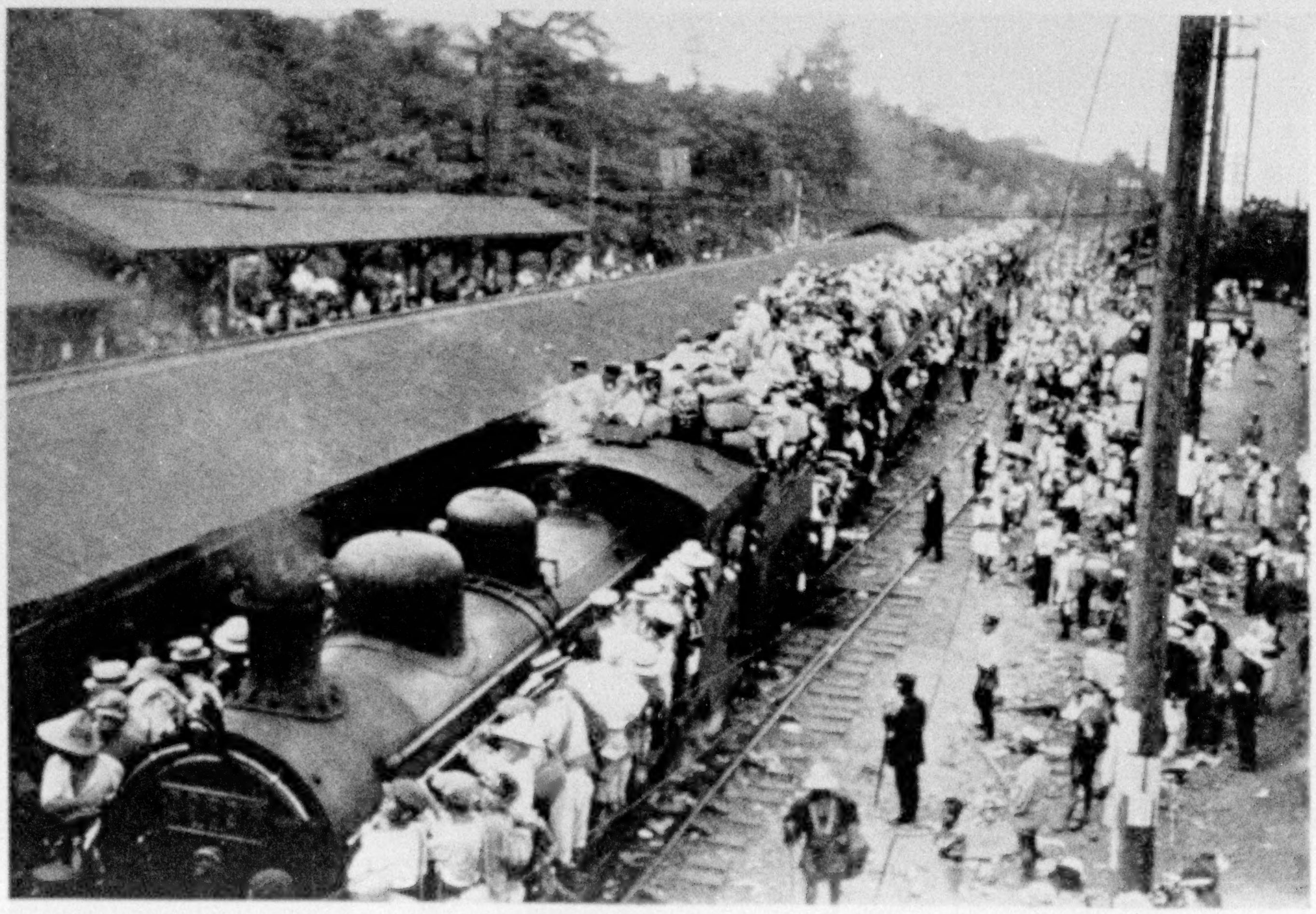
The lava flows from the volcano had begun and the gas explosions had relieved the under earth of millions of tons of matter, so that this quake was probably the evidence of a deep movement, or settling, that had begun along the great chain of Ryu-Kyu volcanoes, extending from Kyushu to Taiwan (Formosa) in a string of islets 900 miles to the southwest.

Simultaneously with the occurrence of the big quake a sudden lava glow was observed on the smoke coming from the volcano. This continued for some time.

According to the barograph records, the air concussions reached a maximum at midnight of January 12. These were so severe that American teachers, who remained in Kagoshima throughout the eruption, testified that their ears were aching as a result of the incessant detonations and the everlasting rattling of the



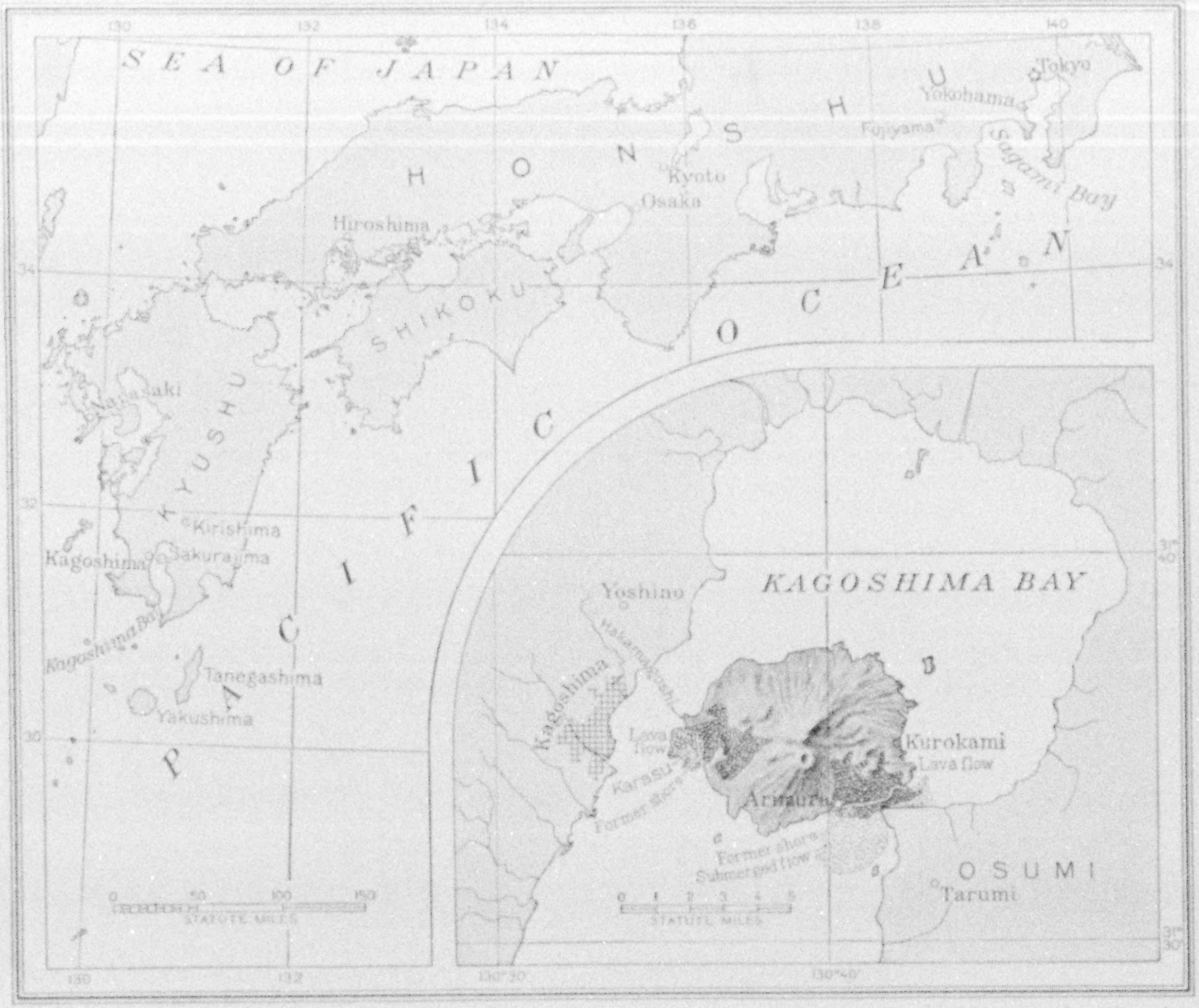
SOLDIERS DISTRIBUTING FOOD AND OTHER NECESSITIES TO THE STRICKEN IN TOKYO



P. and A. Photographs

REFUGEES LEAVING TOKYO

From the railway station of Nippori, a suburb of the capital, thousands made their way toward the northeastern part of the empire. Japanese soldiers put Tokyo under efficient military control and in the metropolitan district there were few of those ghastly incidents which occurred in the outlying portions of the earthquake area.


SEA OF JAPAN
HONSHU
Tokyo
Yokohama
Fujiyama
Sagami Bay
Kyoto
Osaka
Hiroshima
SHIKOKU
KYUSHU
Nagasaki
Kirishima
Kagoshima
Sakurajima
Kagoshima Bay
Tanegashima
Yakushima
PACIFIC OCEAN
0 50 100 150
STATUTE MILES
130
132
134
136
138
140
34
32
30
KAGOSHIMA BAY
Yoshino
Kagoshima
Lava flow
Karasu
Former shore
Kurokami
Lava flow
Arimura
Former shore
Submerged flow
OSUMI
Tarumi
0 1 2 3 4 5
STATUTE MILES
31° 40'
31° 30'
130°30'
130°40'

Drawn by Bumstead and Darley, after Omori

A MAP OF SAKURAJIMA, SHOWING THE LAVA FLOWS OF JAPAN'S GREATEST VOLCANIC ERUPTION

paper partitions of the houses. These teachers continued to send off their correspondence in the midst of this veritable bombardment of sound.

It seems probable that the big earthquake of Monday evening was the climax of strains in the crust of the earth's surface, and that the midnight detonations were the climax of the explosions in the lava column that had been released. The glow which occurred at the time of the quake was probably due to the spouting lava.

PROGRESS OF THE ERUPTION

The outbreak of January 12 was followed by months of intense activity. The lava overflowed new craters, poured into the sea, and created new islands.

There was a short lull on the morning of the 13th, but at 4:09 p. m. there was a startling earth shock, and at about this time lava flows emerged from the slope of Sakurajima nearest Kagoshima.

The gassy flux which at first "went up in smoke" was now contracting to a more fluent substance, moving rapidly the first few hours and then settling down to a clinkery flow, looking more like a glacial moraine than a flood. It was a hypersthene-hornblende andesite — refractory stuff that crystallized in rough sprouts and tumbled fragments, like the AA lava of Hawaiian folklore.*

Similar lava was vomited from eastern vents, which were still in full blast when the writer arrived on the scene, in February.

Explosions hurled up "bread crust"

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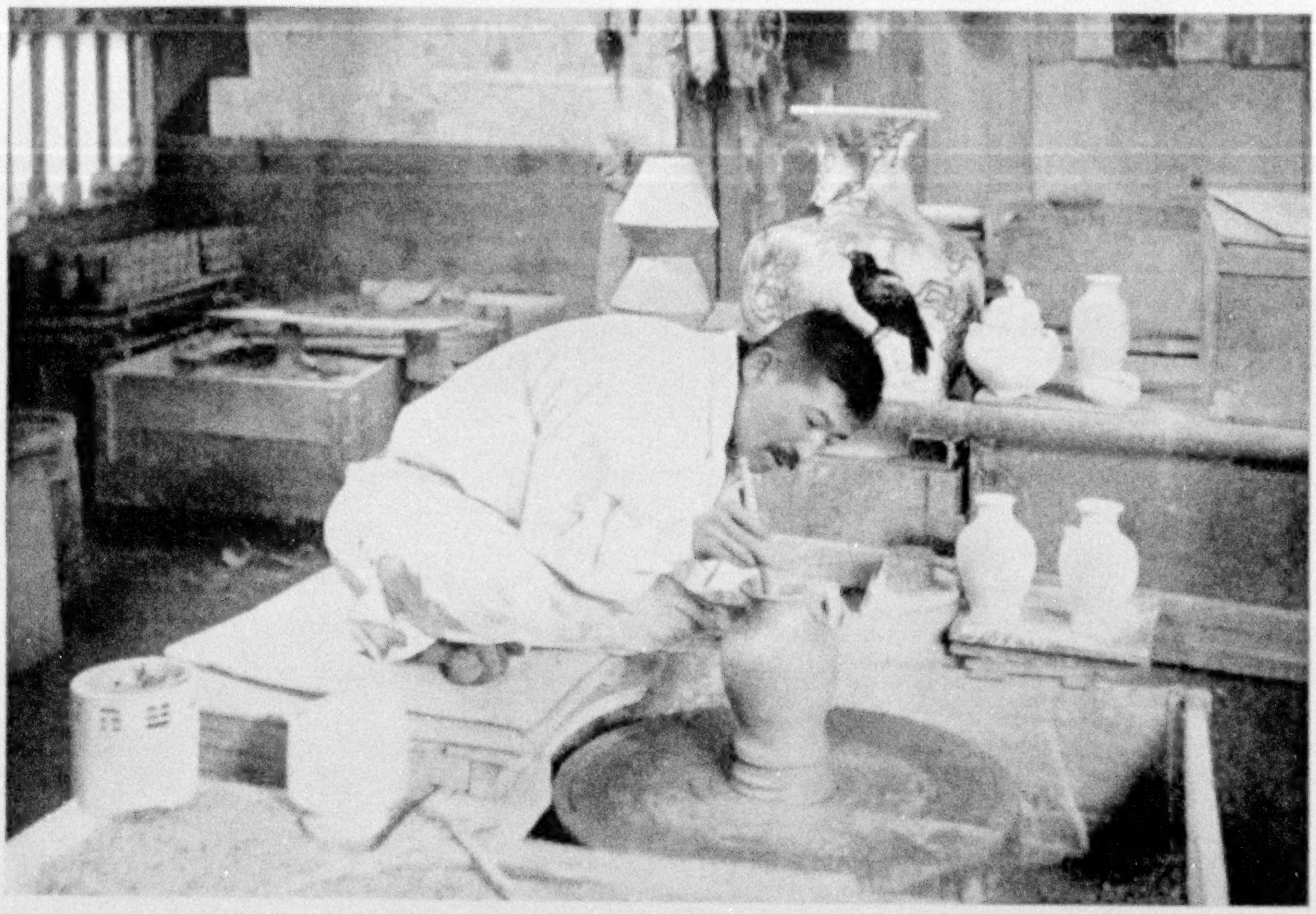
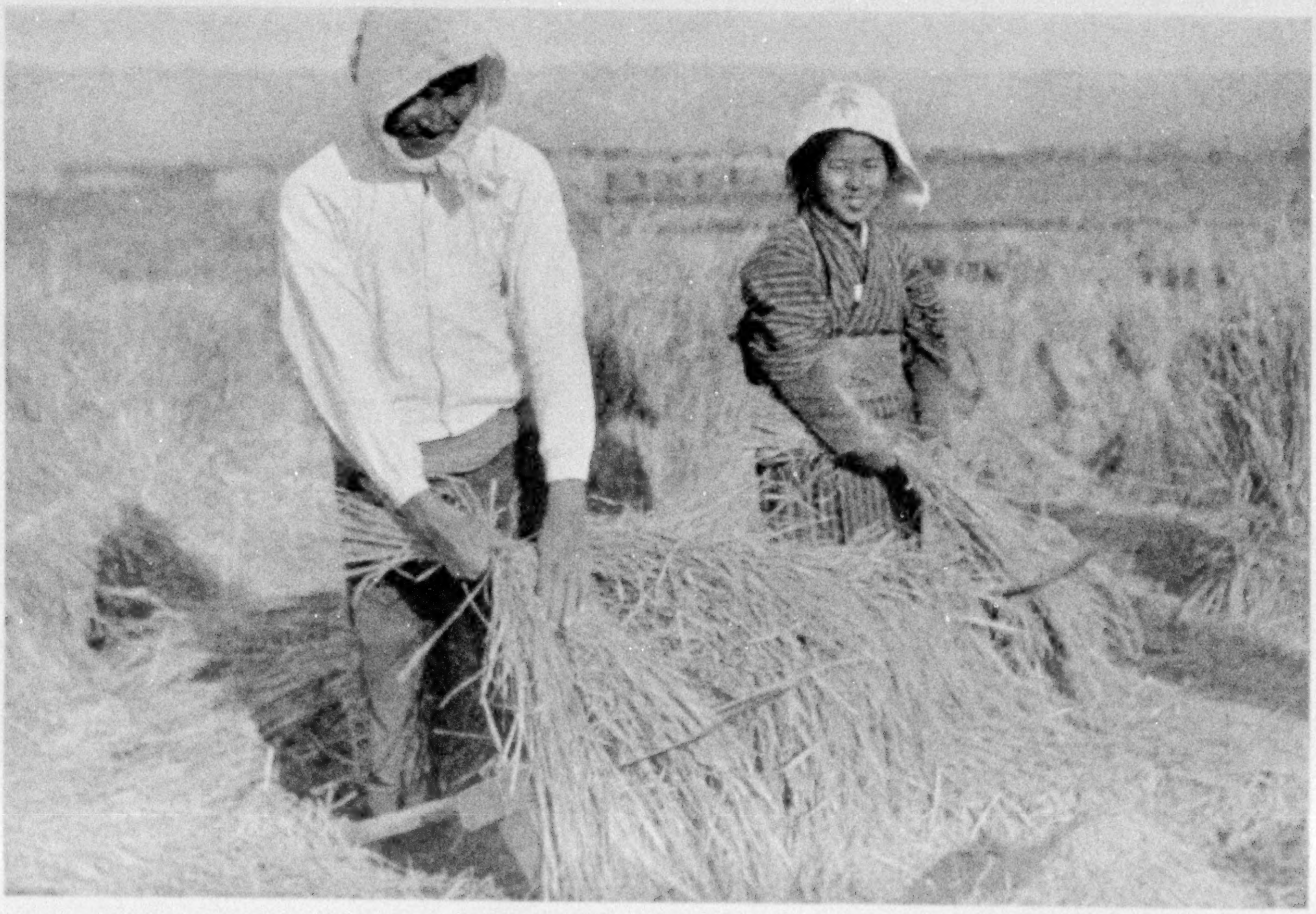
* See "The Hawaiian Islands," by Gilbert Grosvenor, in the NATIONAL GEOGRAPHIC MAGAZINE for February, 1924.



THE POTTER AND THE POTTER'S WHEEL

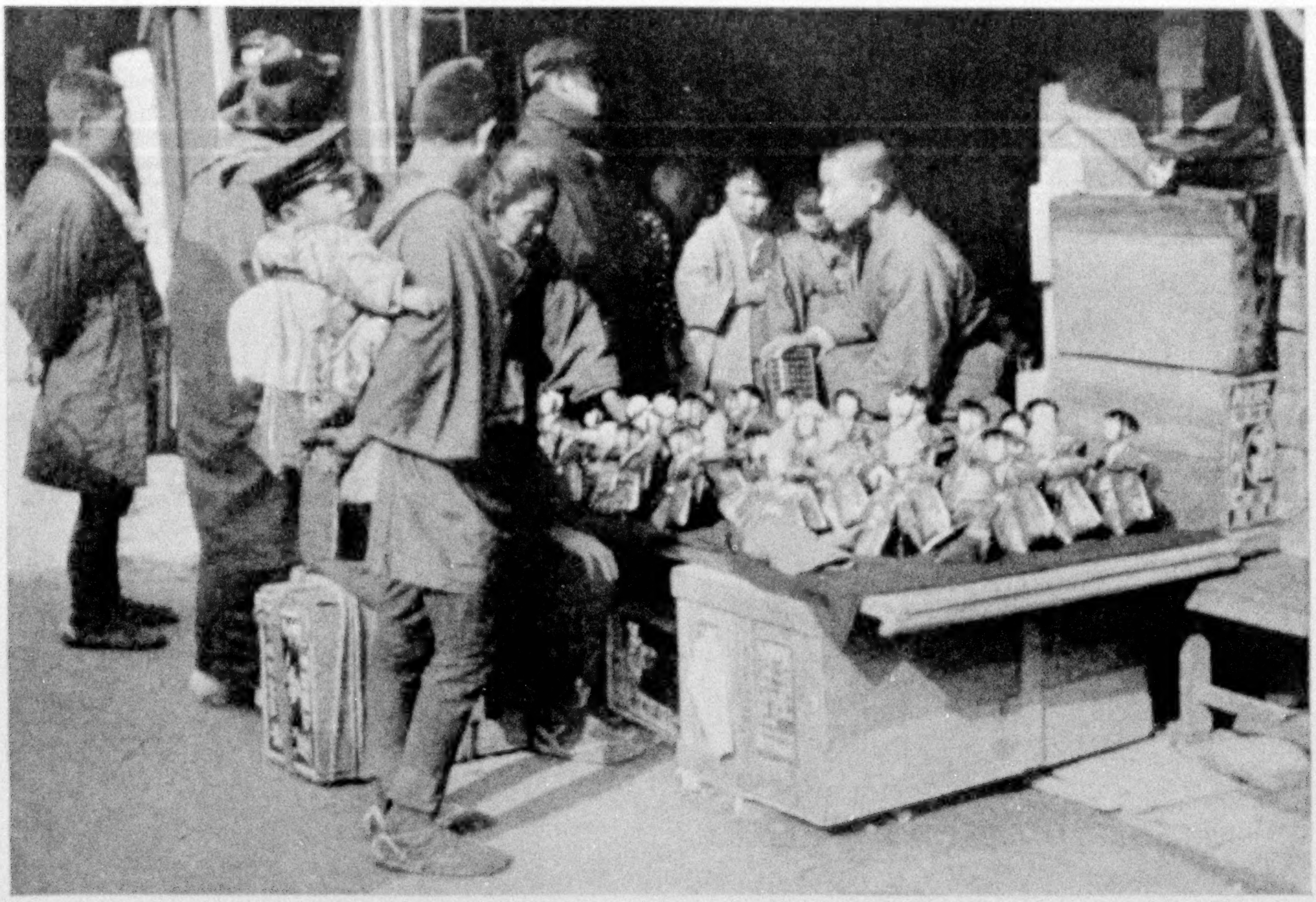
The province where the Sakurajima disaster occurred, in the southernmost end of Kyushu, is the home of Japan's famous Satsuma pottery.



Photographs by Suito

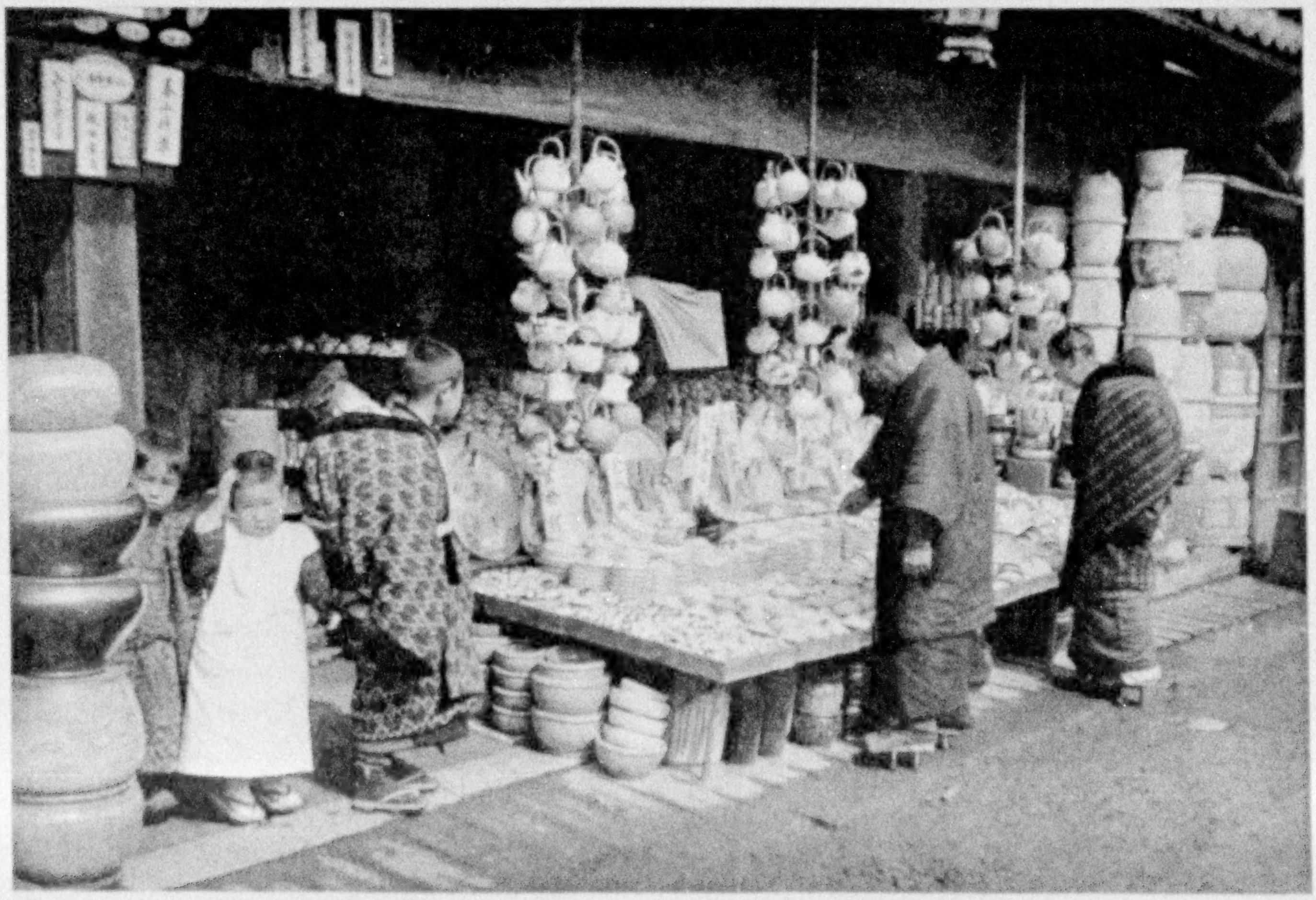
THE REAPERS: A SCENE NEAR KAGOSHIMA

Millions of dollars' worth of crops were destroyed all over Satsuma and Osumi by the fine ash which plastered the soil (see text, page 468).



A TOY SHOP IN A KAGOSHIMA STREET

The vender has in his hand the counting-board (abacus), without which no computing, however simple, is done.

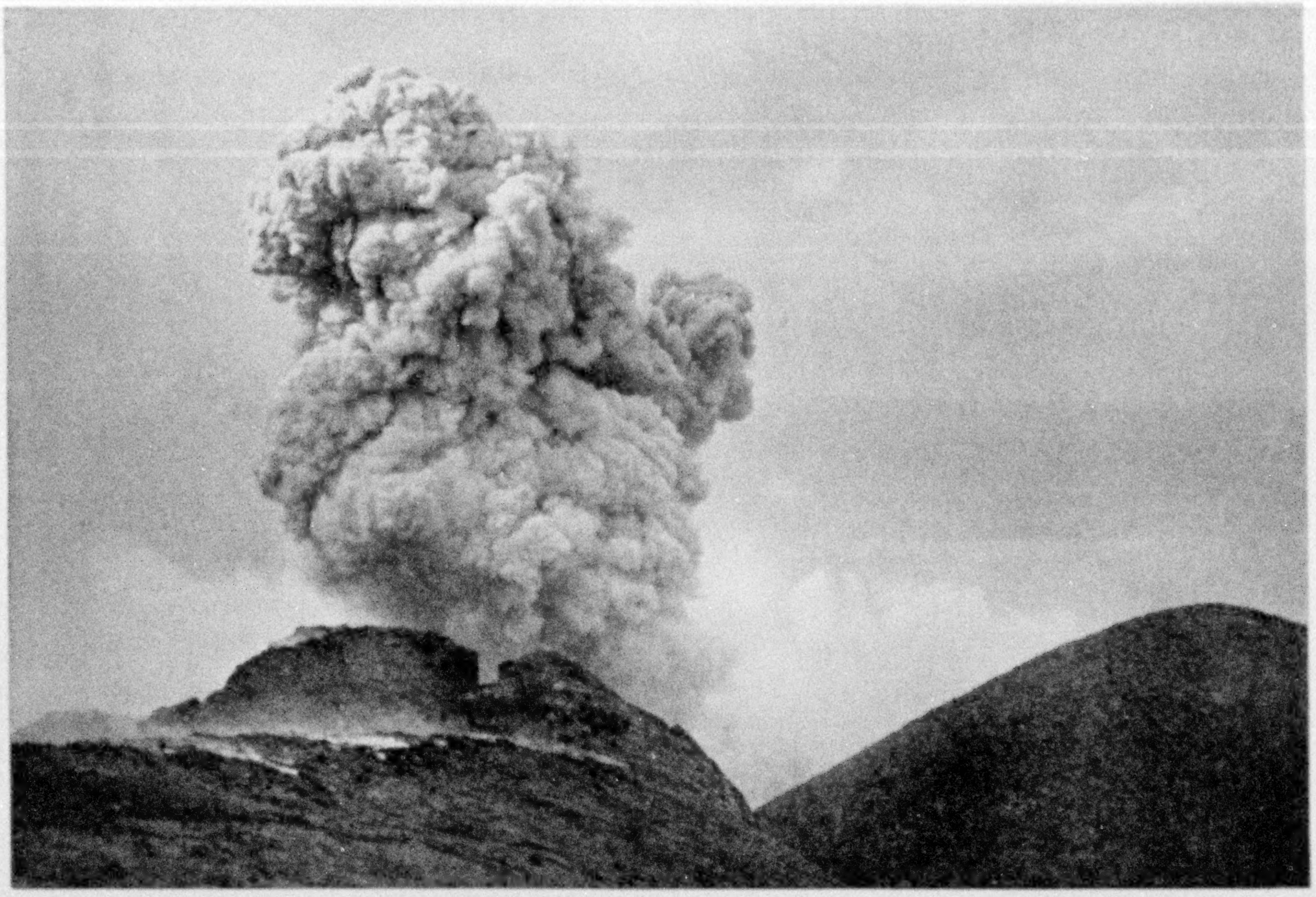


Photographs by Suito

A POTTERY SHOP OF KAGOSHIMA

"Kago" ware, named after this city, is well known to collectors. The Satsuma kilns were founded by two Korean potters late in the 16th century.

XUM



Photograph from T. A. Jaggar

LOWER WESTERN CRATER OF SAKURAJIMA EXPLODING THROUGH THE LAVA FLOW, SEEN FROM ABOVE, LOOKING TOWARD KAGOSHIMA

bombs of semimolten stuff at the fountainheads of the flows, and the steep lava fronts, 15 feet high, caved in and sent up avalanche clouds, and rumbled with tumbling fragments, each as big as a small house.

When the lava reached the sea this hot front made millions of rising tails of cottony steam (see page 469).

A MATCHLESS PYROTECHNIC DISPLAY

The climax of luminosity, accompanied by terrible detonations and concussions, was described as follows by one of the American teachers, Mr. Hoyer:

"On the evening of the 13th, skyrockets of scoria shot from the crater in all directions. Over the mountain hung a huge black cloud of ash in which lightning was zigzagging in long, white streaks (see illustration, page 457). Suddenly, at 8:15 p. m., a tremendous force sent a fountain of fire more than 6,000 feet into the air. Then this brilliant column fell, and from an incredible height tumbled like a vast Niagara of fire in wide streams on to the island and into the water!

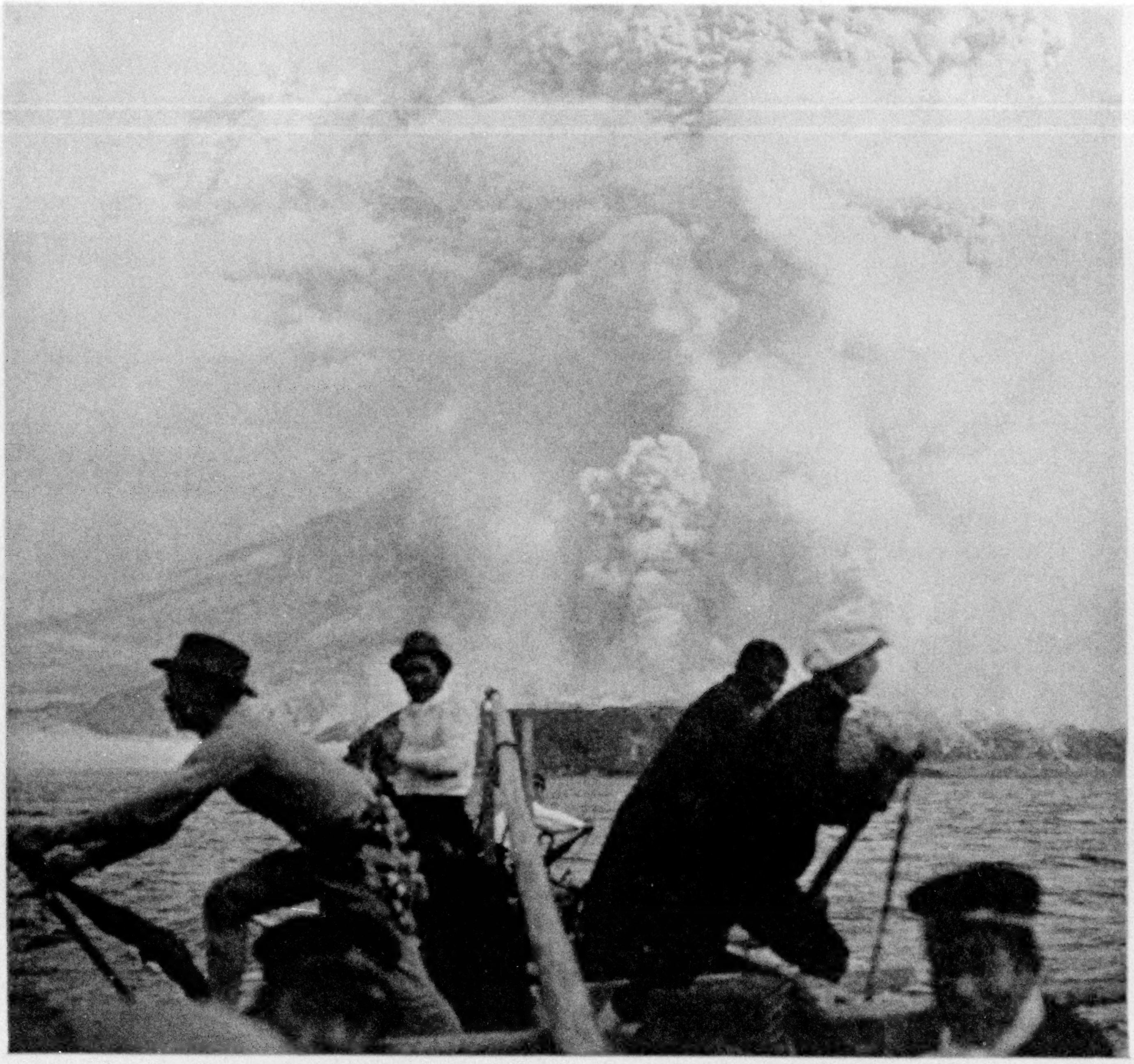
"Smaller fire holes underneath were spouting black clouds, and the tumbling fire seemed to strike rocky obstructions in these spurts and, like water, sent a fiery mist far into the night.

"Under these gigantic falls flowed sparkling cascades of fire toward the sea. They were rapids of raining ash still red hot as they fell and struck.

"Lava streams rushed like molten iron into ravines, filling them, solidifying and piling up in fields of enormous dimensions. This pyrotechnic display continued until midnight.

"When at its height, the tumbling cone spread fire in the remaining forest and villages. The entire western coast line was ablaze. Some of the villages had been built shoestring-fashion along the shore, and the fire ran rapidly along these. Flames leaped high and the remaining embers glowed like a furnace for hours."

The "rapids of raining ash" on this occasion behaved like the famous downrushing blast of Mont Pelée, on the island of Martinique, in the eruption of 1902, setting fire to houses which had resisted the previous bombardment, obliterating the village of Hakamagoshi with bombs



Photograph by Osaka Mainichi Shimbun

EXPLORING PARTY RETURNING FROM THE WESTERN CRATERS AND LAVA FLOW ON THE THIRD DAY OF THE SAKURAJIMA ERUPTION (SEE ALSO PAGE 458)

and gravel and throwing down the trees in lines with their tops away from the mountain, the stumps shredded and punctured by flying stones.

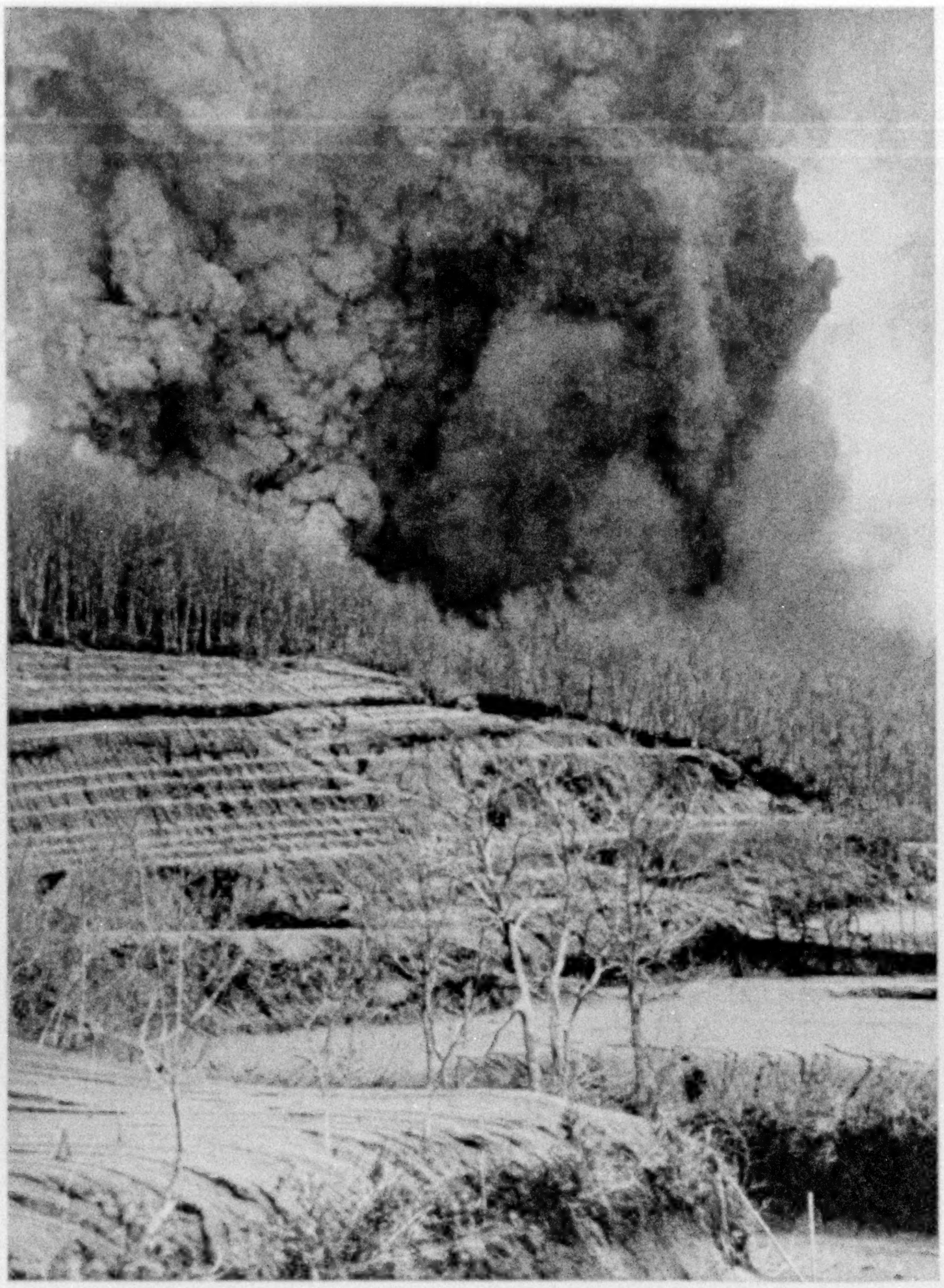
This was the moment of extreme danger for Kagoshima, for the incandescent blast was straight toward the city, scarcely more than two miles away, but its force was spent over the channel.

If the entire eruption had concentrated about a western crater, Kagoshima would have been destroyed; but the outcome was happy for the city, in that explosive activity in the west craters ceased after January 20; the lava from that time became sluggish on that side and concentrated its activity at the eastern craters, which continued exploding into the summer months.

After January 14 the eruption quieted gradually (see page 456). Immense patches of pumice floated on the bay, brown and white roundish fragments, one to four inches in diameter, at first in such masses as to impede boats (see pages 463 and 465). The lava pushed out into promontories and tongues submerged by the sea.

As the wind was mostly eastward, the heavy ash fall accumulated deepest in the sparsely inhabited Osumi country (see illustrations, pages 467 and 468).

The western lava flow was more than three miles long, to the sea front, and varied in width from less than a mile near the source to two miles in the region of the former shore line (see pages 456 and 458).



Photograph from T. A. Jaggar

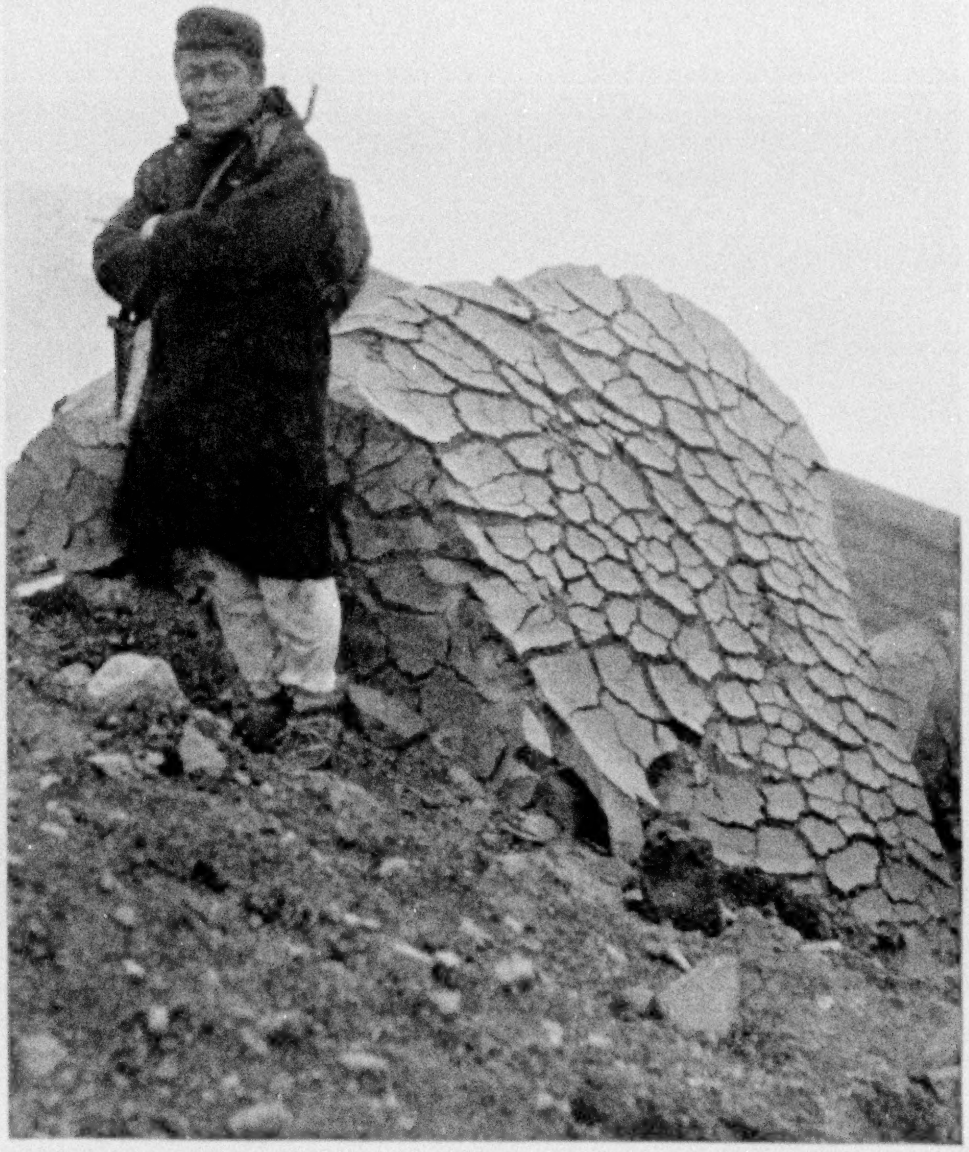
TERRACED FARM LANDS UNDER ASH: SOUTH SIDE OF SAKURAJIMA AT ARIMURA

The more voluminous east lava flow came from three pairs of craters, each pair consisting of an explosion hole above and a lava outlet below. All three were in action in February when I saw them—gaping fissures in a line, exploding like artillery, with piles of débris on either hand. From the heights one could see a snakelike stream of glowing lava flowing between boulders, at the rate of a hundred feet per hour on the surface, to a region farther down the slope, where the motion became lost to view.

The flows divided into lobes at their lower ends, and one of these buried Seto and filled the strait which had separated the island from the Osumi mainland. The historic moment when Sakurajima Island became a peninsula occurred on the afternoon of February 1, when the last pools of boiling salt water were obliterated by the tumbling slag, which began to pile up against the steep Osumi shore. Twice thereafter the road along the shore had to be moved higher, as the lava buried it. During the month this lava rose to a height of 300 feet above sea-level, where before there had been water 200 feet deep (see page 462).

On February 19, I tested with a thermometer the sea water over the submarine lava lobe off the Osumi shore. Where the strait had been closed and near the lava front, the temperature was 138 degrees Fahrenheit. We rowed out to a ship, trailing the thermometer in the water and passing across a submarine tongue of hot lava, as was afterwards proved by soundings. First, the temperature steadily fell to 100 degrees; then rose to 115°, 120°, 125°, 132°, and 138° (over the submerged lava tongue); then it began falling—118°, 115°, 102°, 80°, and finally, at the ship's side, 66°. It was a singular experience to row through such hot water, with clouds of vapor on all sides, knowing that to capsize would mean death.

There was a recrudescence of big explosions at the eastern craters, reaching a maximum March 11 and 12, when Mr. F. A. Perret was studying the volcano. He described cauliflower explosions brightly incandescent in full daylight, reaching a height of 10,000 feet, and blowholes of paroxysmal gas puffing almost continuously on the flowing lava at terrific pressure. Mr. Perret was caught near flowing lava that masked a crater battery which had a habit of firing once in five hours. It exploded through the lava flow, throwing out a shower of bombs that inflicted some injury upon him and his attendant. Fortunately, very large boulders were at hand, under which they took refuge.



Photograph from T. A. Jaggar

A GIGANTIC BREAD-CRUST BOMB ON THE EDGE OF KIRISHIMA CRATER

This volcano, north of Sakurajima, was in eruption two months before the outbreak of the latter (see text, page 444).

HOW THE PEOPLE WERE CARED FOR

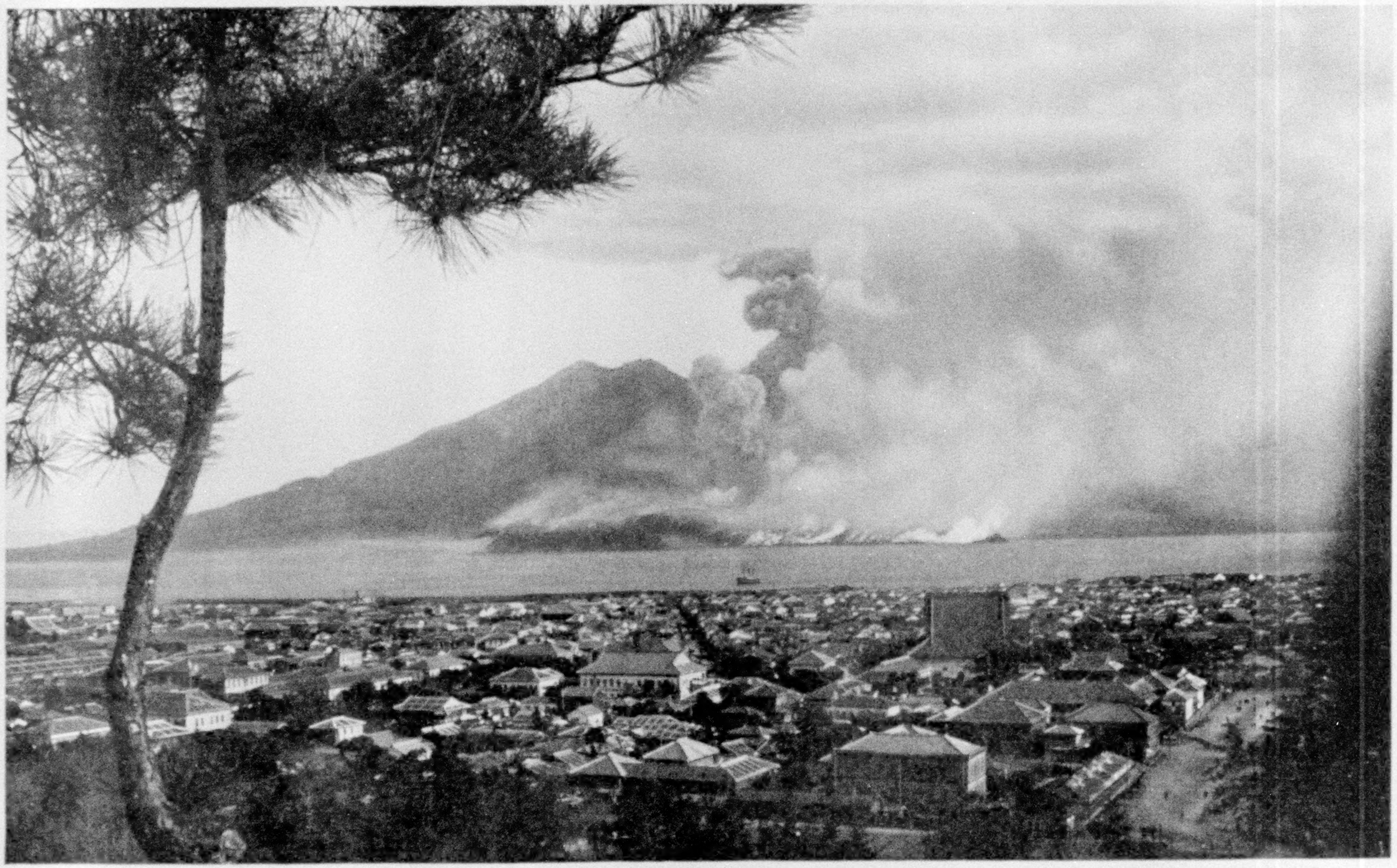
The remarkable record of life-saving in the Sakurajima eruption was partly due to good luck, but also to the instinct of the people, to the wisdom of the government, and to scientific societies. Army, navy, and police officials took control; steamship companies, newspaper men, and high-school boys organized rescuing expeditions to the island, in the face of the terrifying explosions, and carried away every living soul they could find.

It is said that an aged woman in Kurokami, below the east craters, refused to go. She lived through the eruption, in one of the steeper thatch-roofed houses, whence the ash and sand slid off, until the heap reached the eaves. Such buildings stood where the flat-roofed structures collapsed (see illustration, page 464). Twenty or thirty persons were injured and taken to the hospitals, and two persons jumped into the sea and were drowned, but, so far as is known, *the volcano killed no one.*

People camped in temple grounds and in cemeteries, business houses offered relief, and 5,000 destitutes were accommodated in schools, temples, and public buildings (see page 460). A continuous caravan of emigrants moved across country.

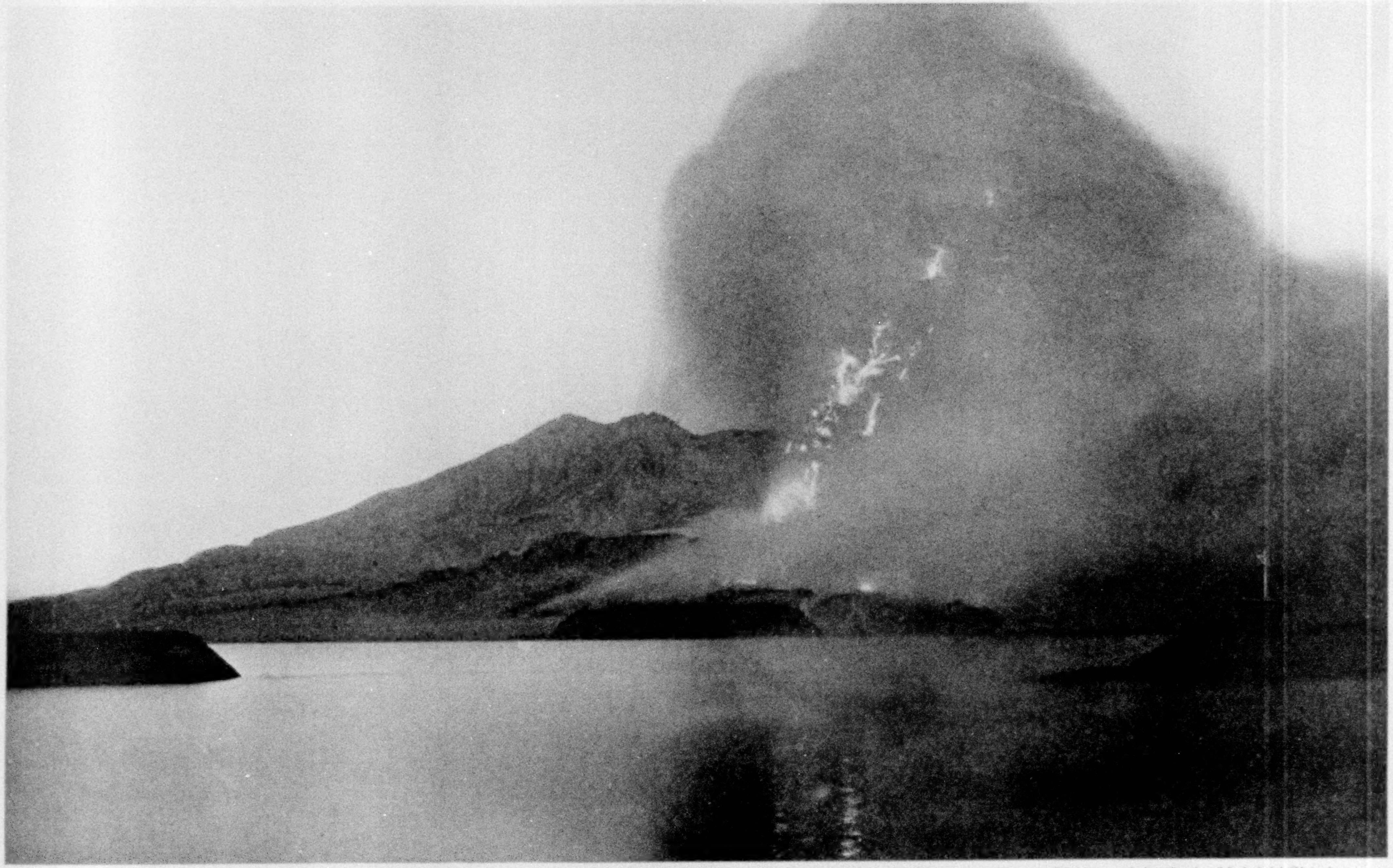
Then came the earthquake, and consternation reigned. January 13 was a day of general exodus, and Mr. Hoyer "walked through the deserted streets of Kagoshima without meeting more than five people in a mile; shops were nailed shut; soldiers took up their quarters on street corners and guards walked their beats."

There were no ghouls and no looters. Officials remained at their posts, but the population fled. The general in charge of an army detachment that was bound



Photograph from T. A. Jaggar

SECOND STAGE IN THE ADVANCE OF THE WESTERN LAVA FLOW, ON THE FOURTH DAY OF THE SAKURAJIMA ERUPTION: LAVA HAS REACHED THE SEA BACK OF KARASU ISLAND (SEE ALSO PAGE 469)

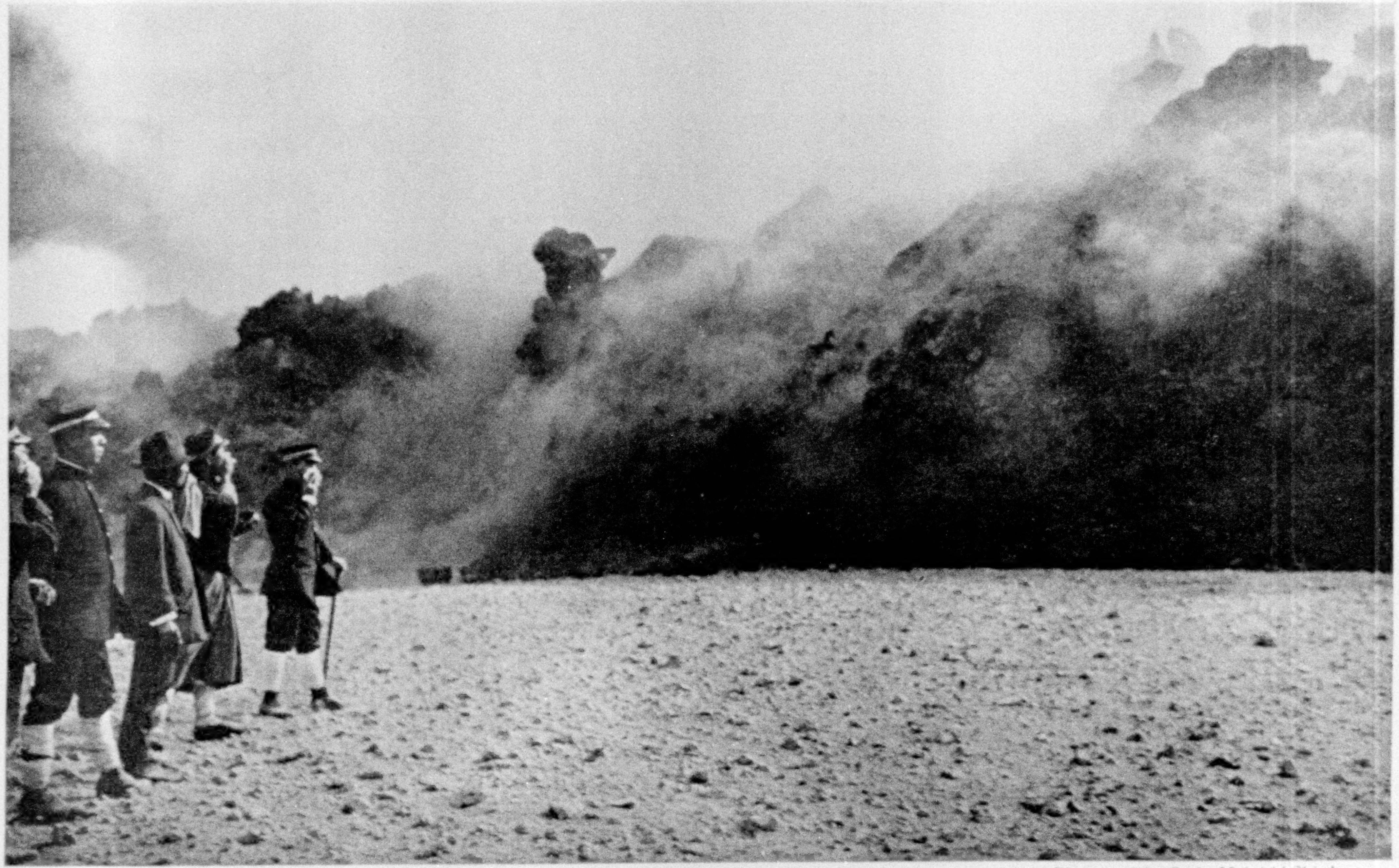


Photograph by Osaka Mainichi Shimbun

SAKURAJIMA FROM KAGOSHIMA ON THE THIRD NIGHT OF THE ERUPTION: LIGHTNING FLASHES ARE TO BE SEEN IN THE EXPLOSION CLOUD

An old Japanese manuscript, describing an earlier eruption of Sakurajima, gives this vivid word picture: "It was so dark that it seemed as though powdered ink filled the air; thunder and quakings came together and the whole world was noise."

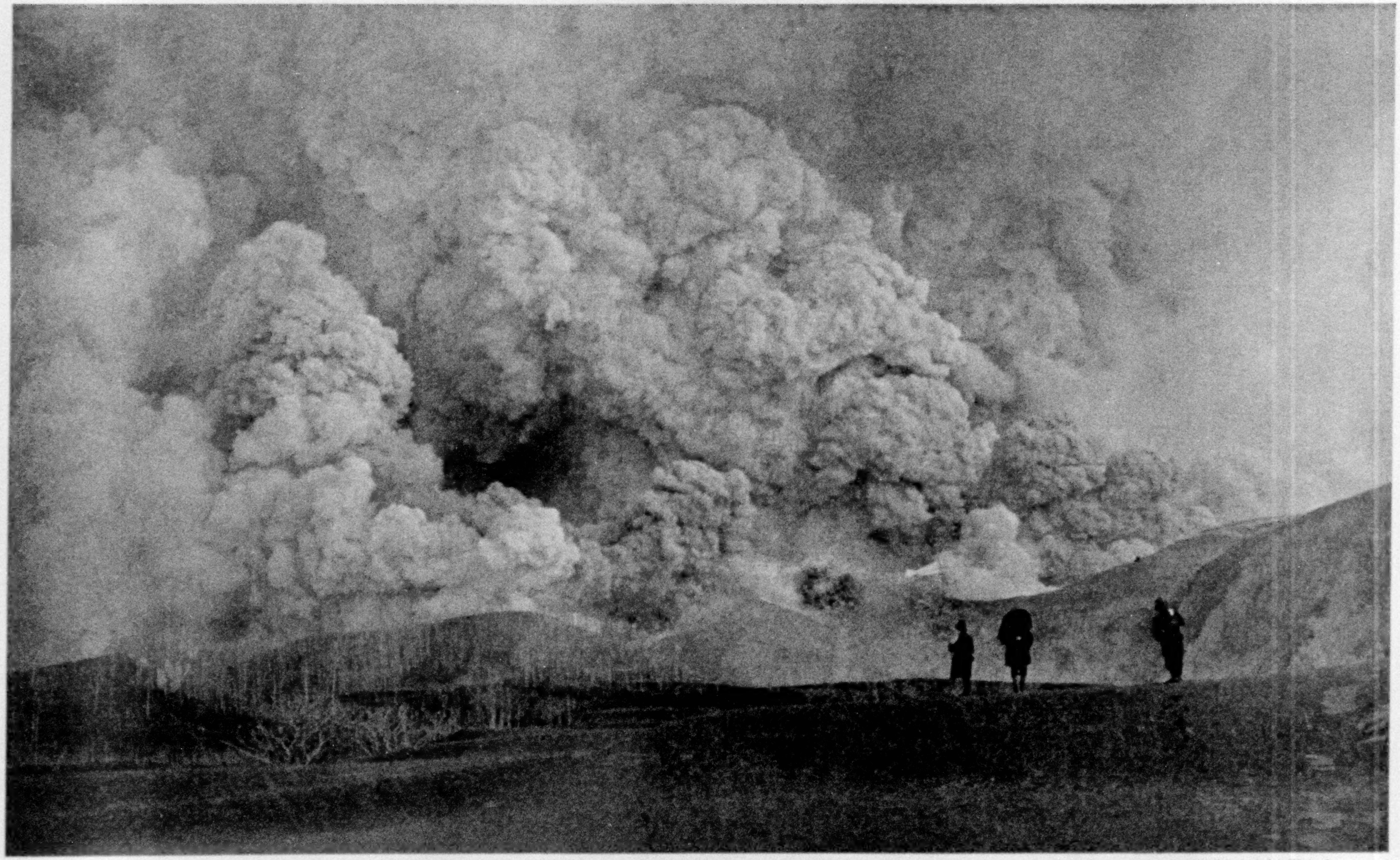
XUM



Photograph by Osaka Mainichi Shimbun

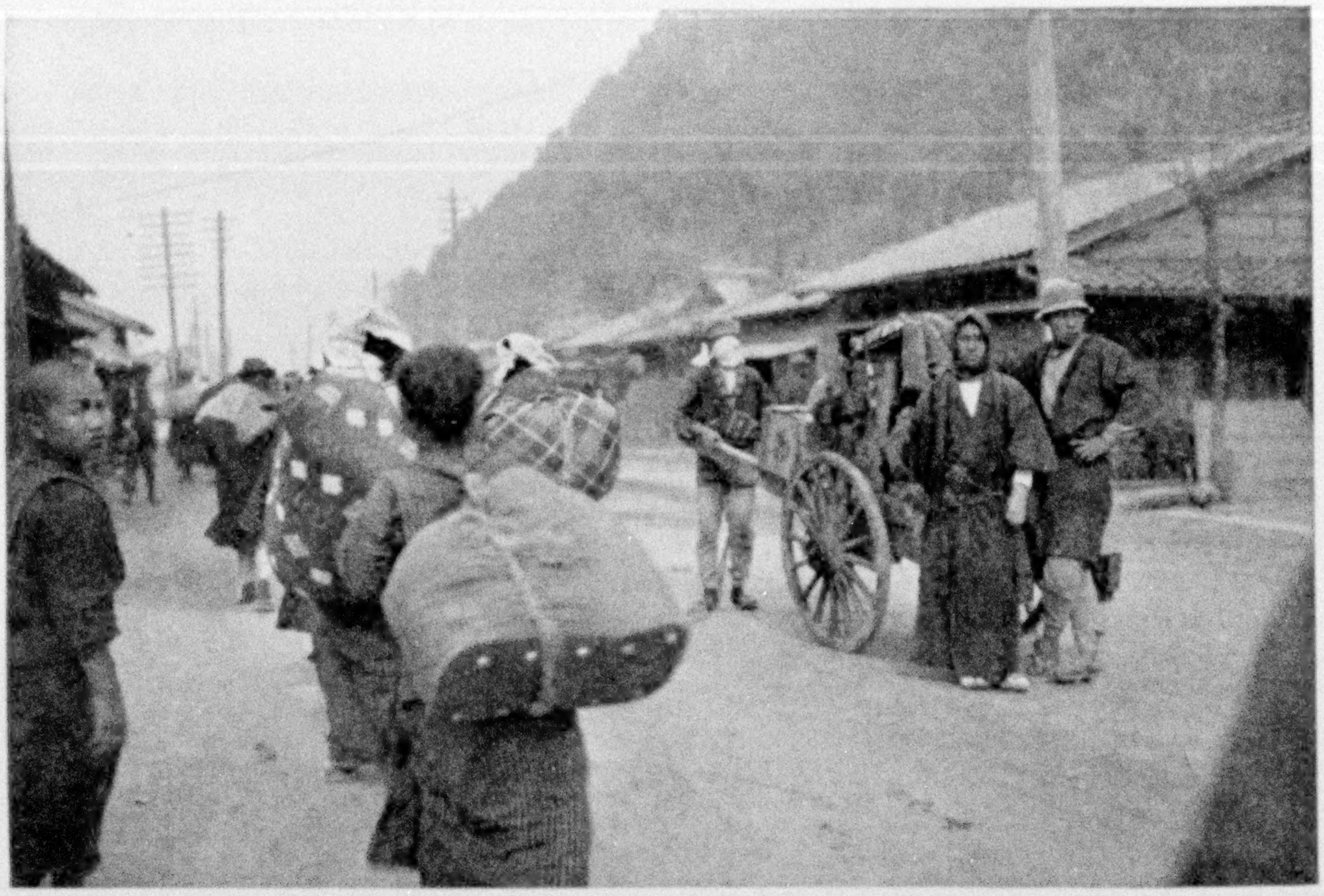
AN EXPLORING PARTY AT THE WESTERN LAVA FRONT ON THE THIRD DAY OF THE ERUPTION

Note the handkerchiefs over the faces to protect throats from hydrochloric acid fumes.



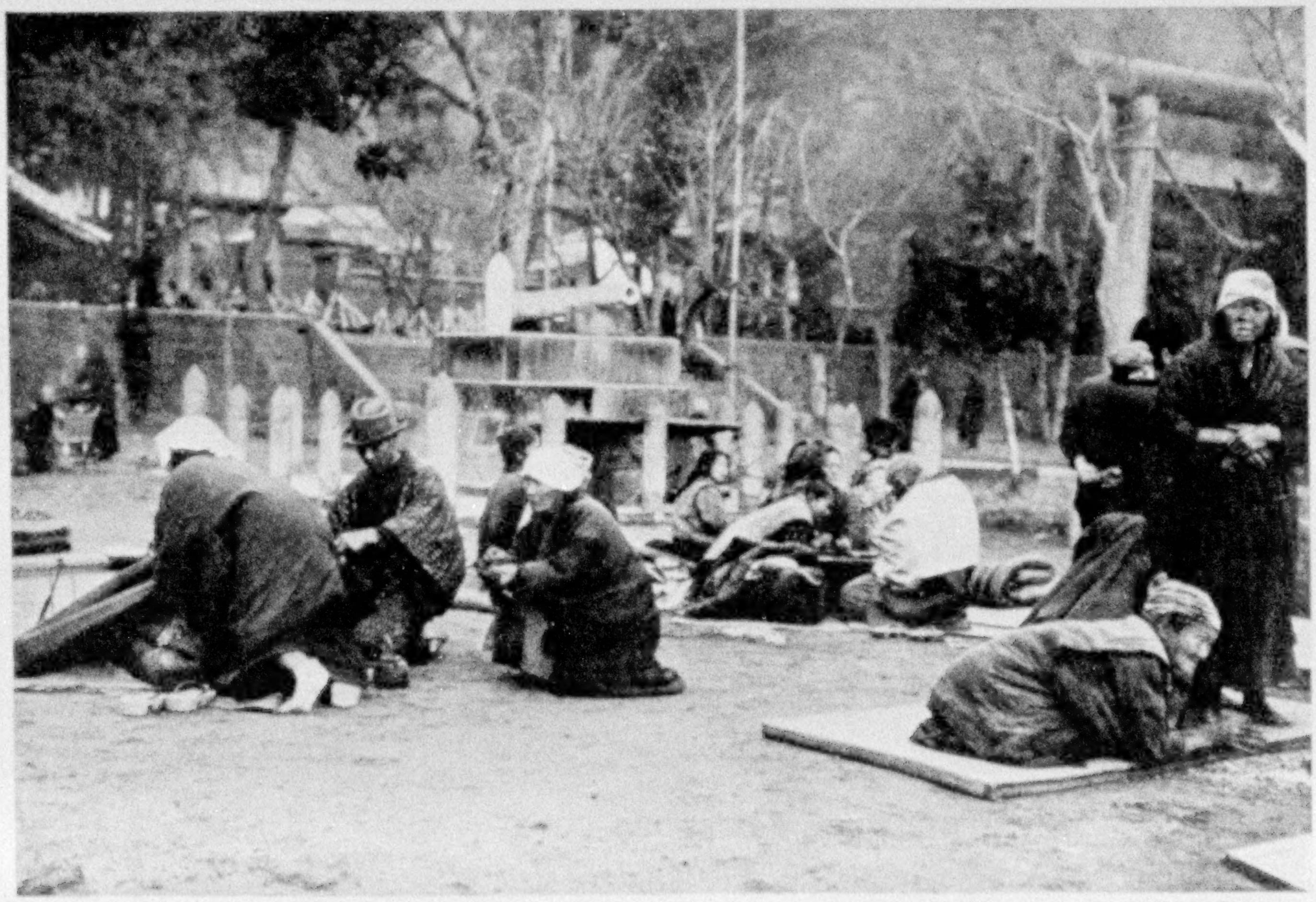
Photograph by Osaka Mainichi Shimbun

THE EASTERN LINE OF EXPLOSION CRATERS AND THEIR PILED-UP CONES AND VENTS: TENTH DAY OF THE ERUPTION



REFUGEES FROM SAKURAJIMA FLEEING WITH THEIR HOUSEHOLD GOODS

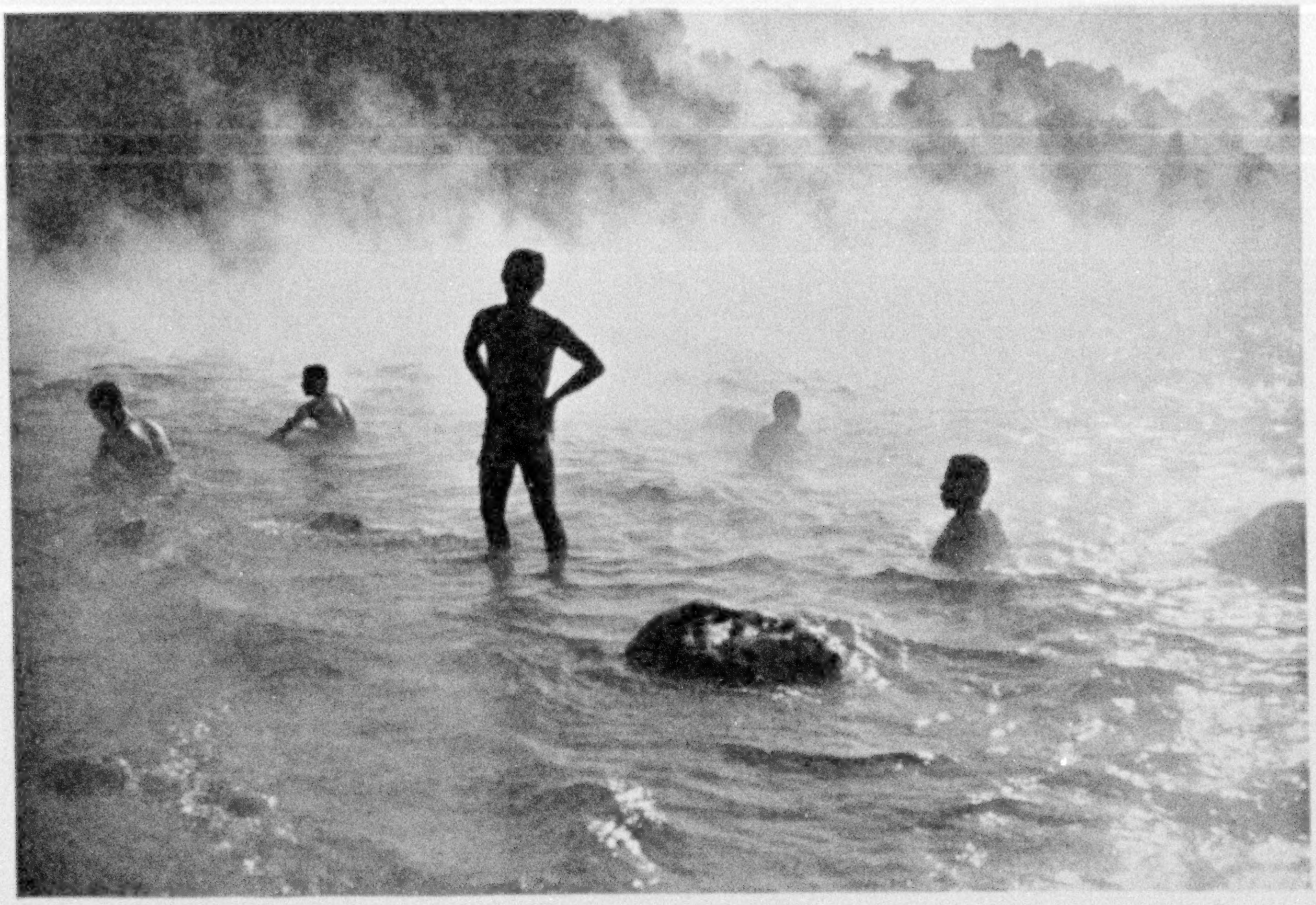
Twenty-two thousand persons left the island, and not a single death was attributable to the volcano directly (see text, page 455).



Photographs from T. A. Jaggar

REFUGEES ENCAMPED IN TEMPLE GROUNDS IN KAGOSHIMA

Everyone was cared for, and in outlying towns the young men's clubs organized hospitality committees which were very efficient (see text, page 462).



Photograph from T. A. Jaggar

HIGH-SCHOOL BOYS BATHING IN HOT SEA-WATER ABOVE THE LAVA

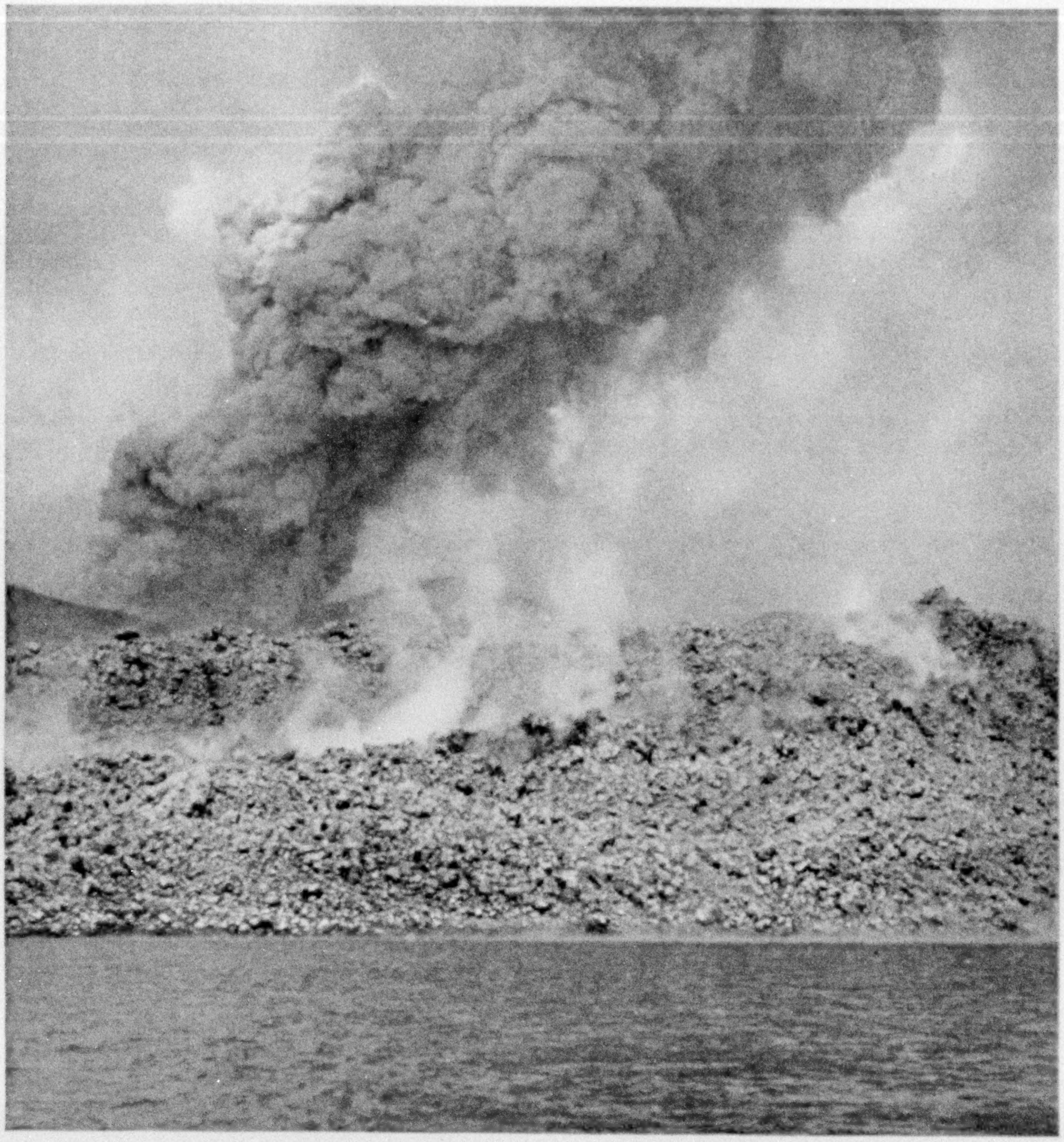
Whenever an exploring party went into danger the high-school boys were to be found (see text, page 455).

Photograph by Suito

A GROUP OF HAPPY REFUGEES

"The children in the schools ran to the windows to look. They were instantly dismissed" (see page 447).

XUM



Photograph from T. A. Jaggar

THE EASTERN MAIN CRATER AND THE SOUTHEAST LAVA FRONT; SAKURAJIMA

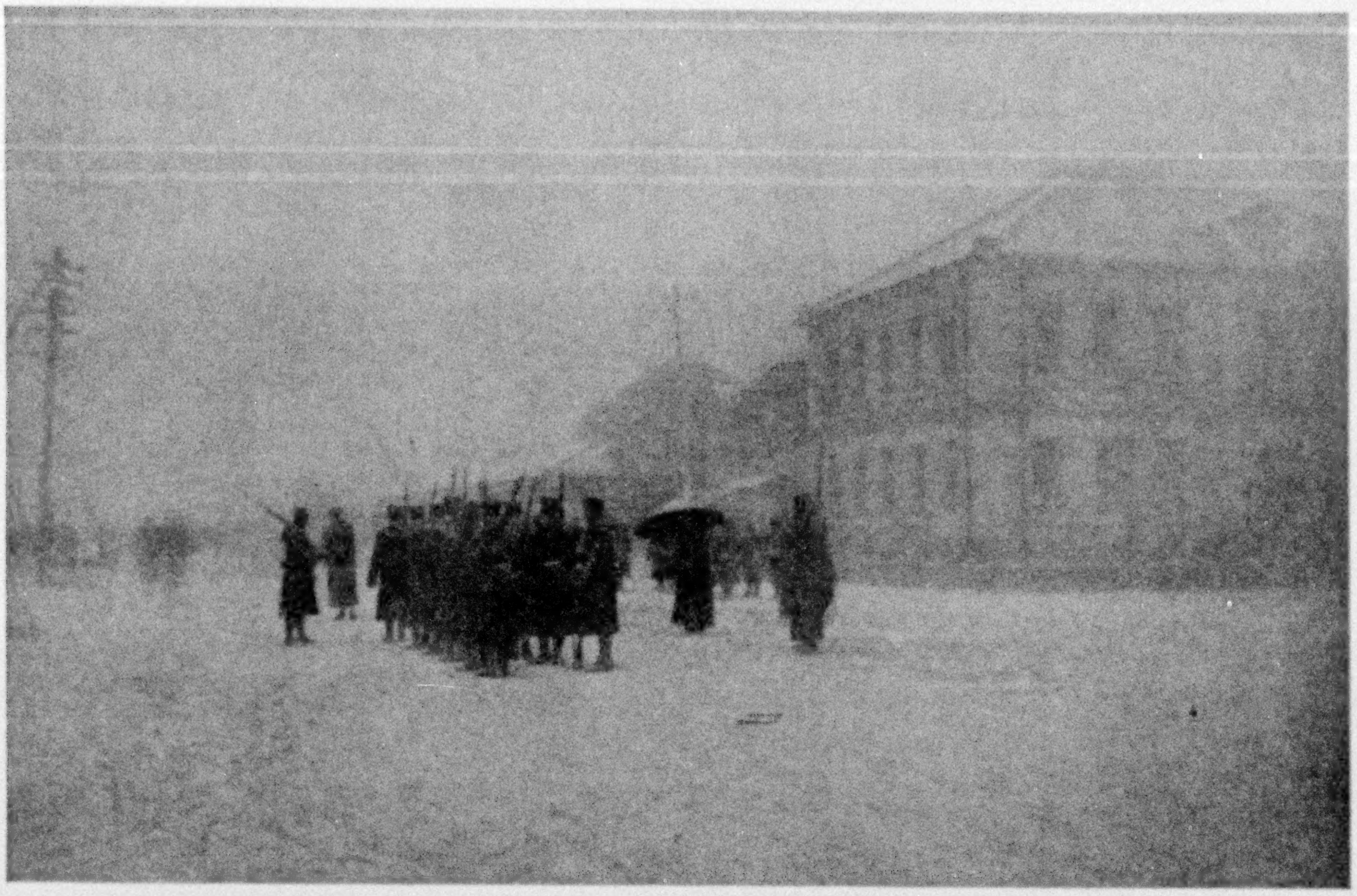
The block lava is piled more than 300 feet above sea-level (see text, page 454). The water in the foreground is hot.

for the Ryu-Kyu Islands diverted his transports to rescue work. The young men's clubs of the outlying towns received the refugees, suppressed profiteering, and systematically provided lodgings.

Professor Sasamoto and other teachers in the higher schools of Kagoshima were familiar with the tragedy at St. Pierre at the time of the Mont Pelée eruption; they knew Sakurajima and their views had been made public.

Mr. Katsuno, director of the observatory, kept steadfastly the record of earthquakes and atmospheric changes, and did not commit hara-kiri, as was reported at the time through the malignant gossip of carping critics. It is an astonishing commentary on the advanced ideas of modern Japan that they should blame weather observers for not knowing in advance all about volcanoes!

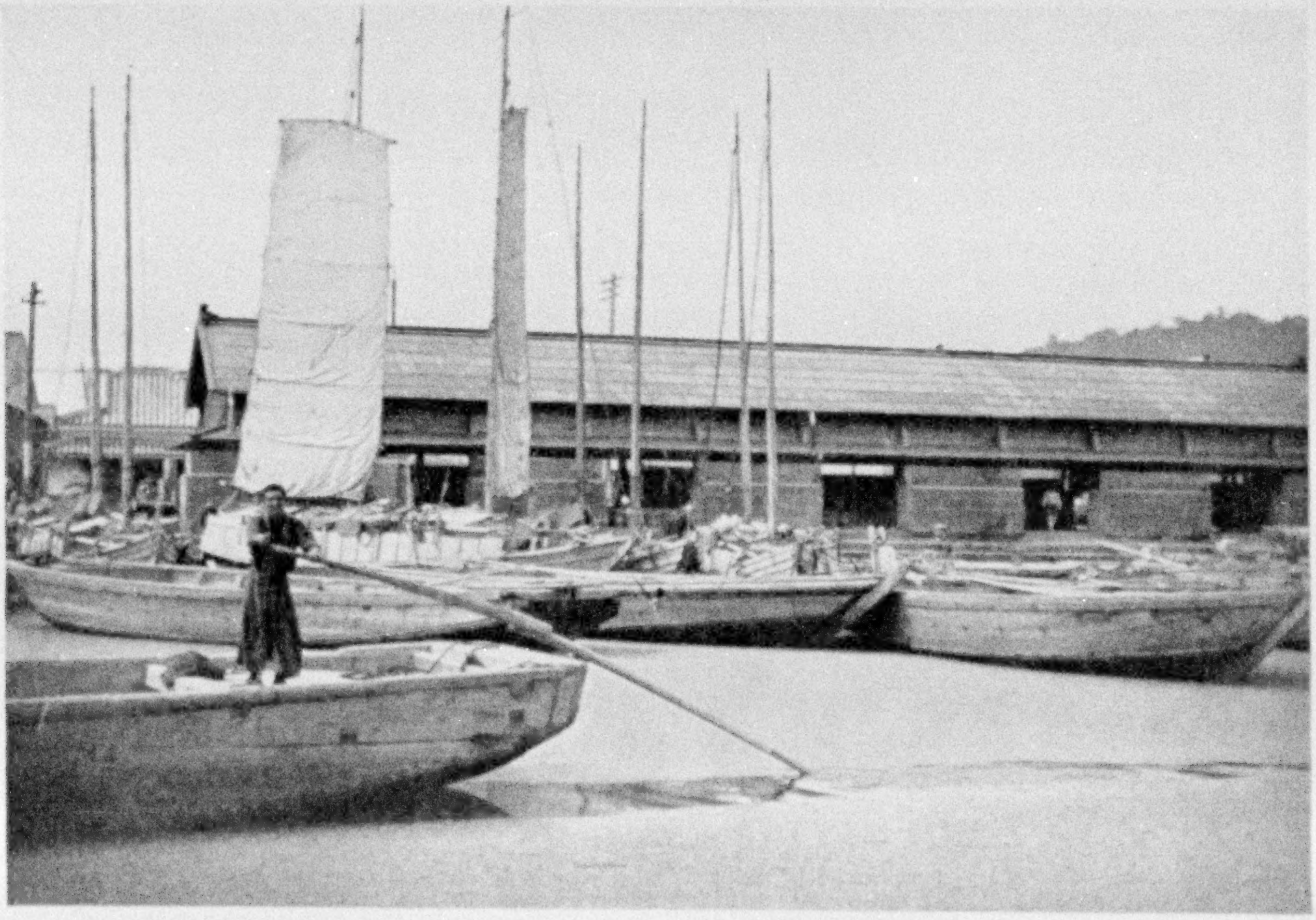
On January 14 Dr. Omori arrived, brought two new seismographs, and posted an official bulletin to the effect that the worst was over; so that thereafter the population straggled back into the city



Photograph from T. A. Jaggar

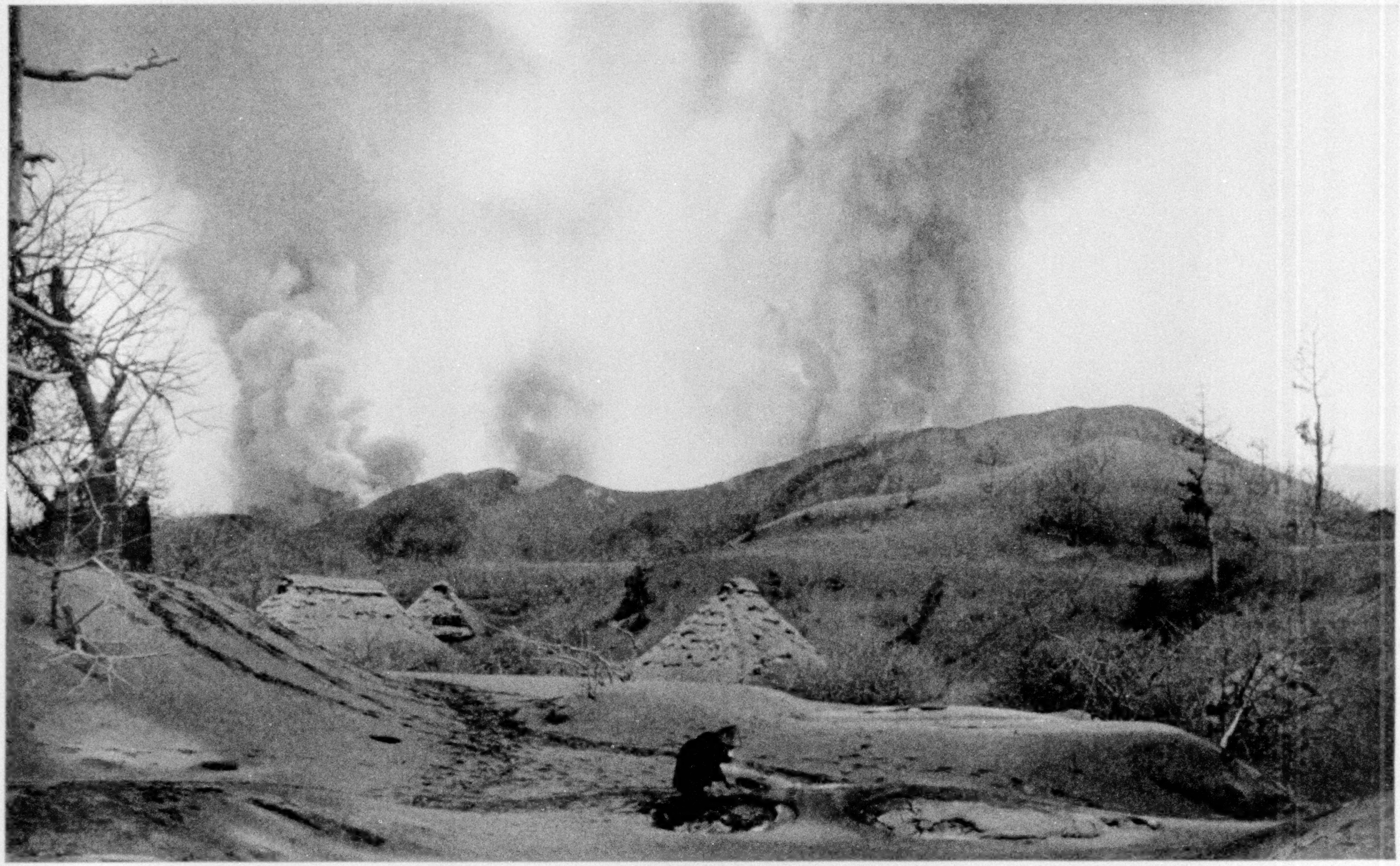
PHOTOGRAPH EXPOSED TWENTY SECONDS IN AN ASH STORM IN KAGOSHIMA DURING THE SAKURAJIMA ERUPTION

The effect is like a snowstorm. Celluloid goggles to protect the eyes were in great demand.



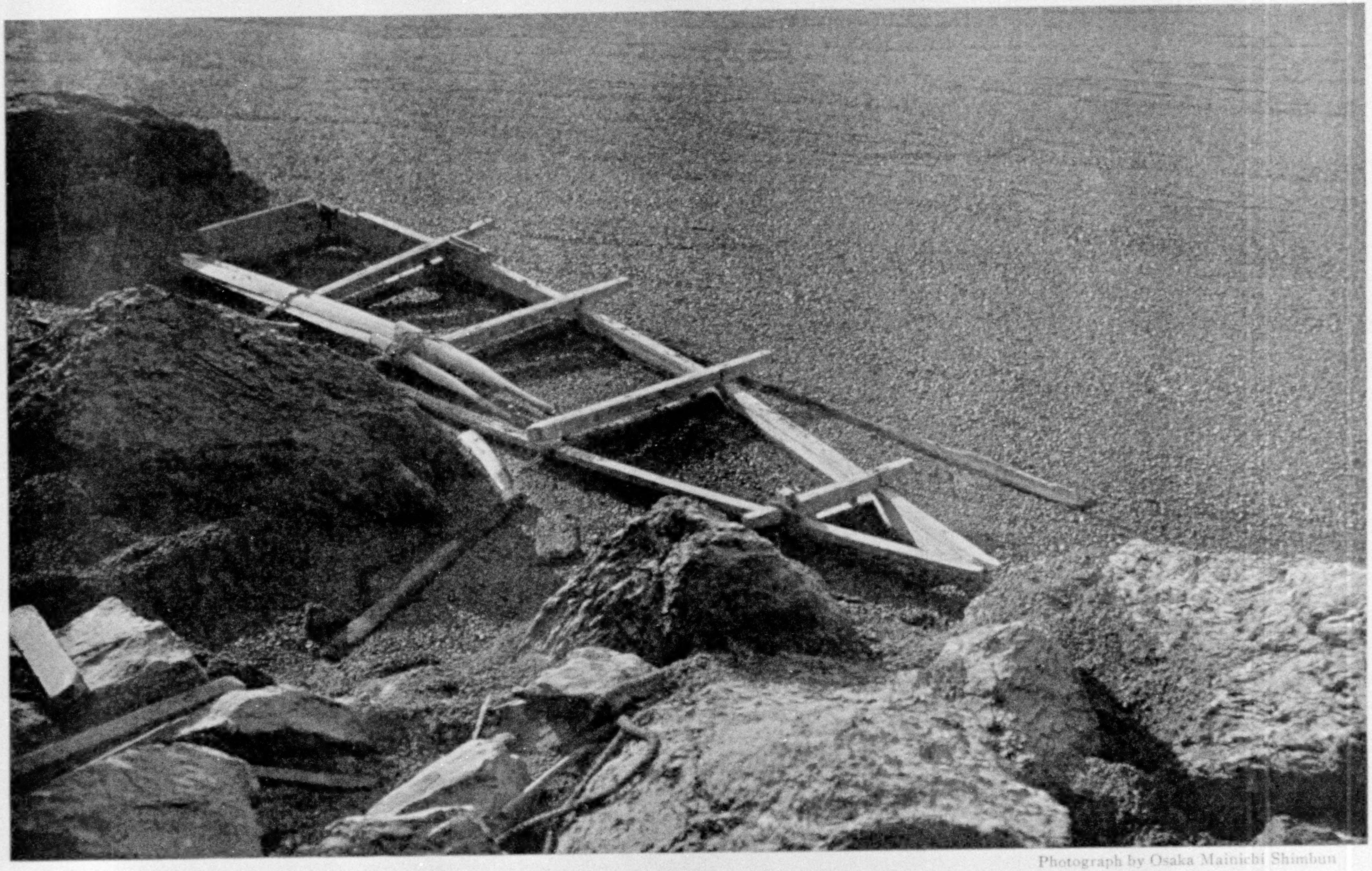
Photograph by T. A. Jaggar

FLOATING PUMICE IN KAGOSHIMA DOCKS MAKING THE SURFACE OF THE WATER LOOK LIKE A SAND BEACH (SEE TEXT, PAGE 453)



Photograph from T. A. Jaggar

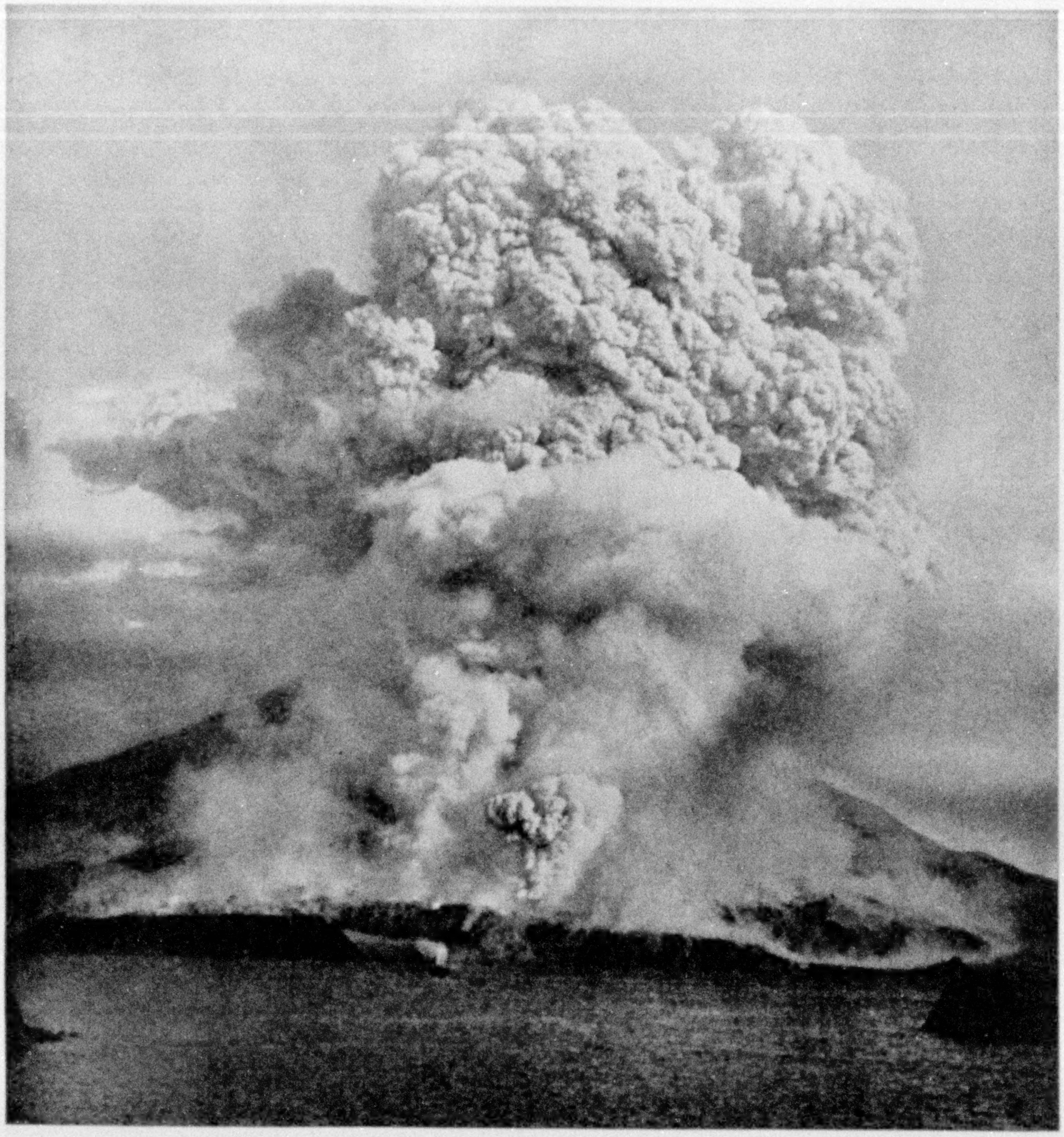
A HOMELESS WANDERER SEARCHING FOR HIS FLAT-ROOFED DWELLING AT KUROKAMI, NEAR THE EASTERN CRATERS
(SEE TEXT, PAGE 455)



Photograph by Osaka Mainichi Shimbun

A BIT OF THE OSUMI COAST, EAST SIDE OF KAGOSHIMA BAY, SHOWING A SWAMPED SAMPAN IN A SEA OF PUMICE

The pumice shows the wave action. This illustration recalls an old Japanese chronicler's account of the Sakurajima eruption of 1779: "These light stones were blown out from burning holes on the mountain; they fell in the water and would not sink, making the sea look as though covered with matting." This account relates that three men started across the bay on foot, the packed pumice acting as a bridge; one man broke through and lost his life.



Photograph from T. A. Jaggar

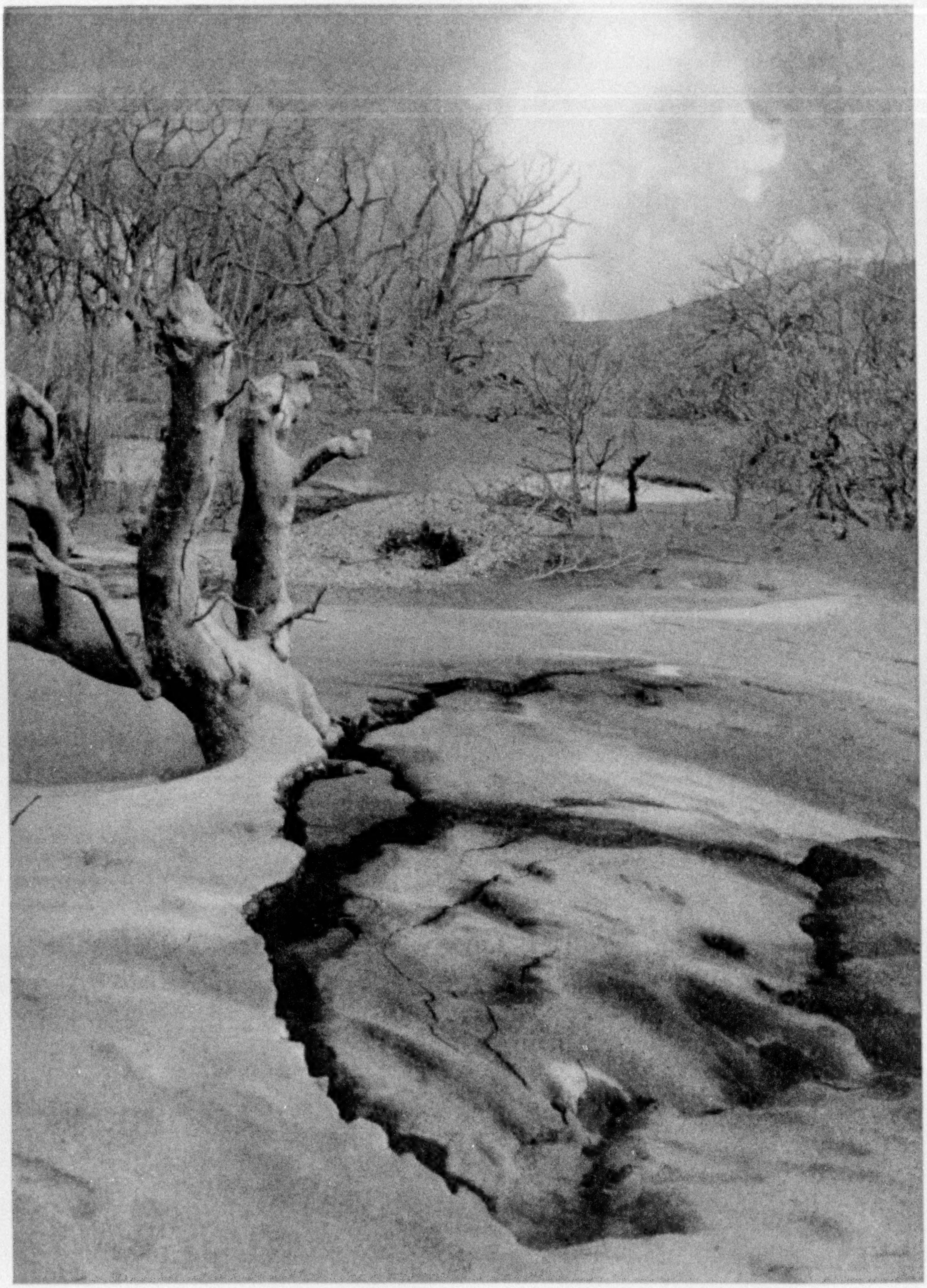
THE FINAL STAGE OF EXPLOSIVE ERUPTION OF SAKURAJIMA, AFTER LAVA HAD BEEN FLOWING MORE THAN A DAY

and the shops and hotels were opened. The behavior of the volcano confirmed his dictum.

Railway connections were broken for one day only and telegraph connections for a few days. Relief funds poured in from all over the world, but there was no suggestion of "graft." The government authorities promptly took an inventory of damage and immediate needs, and the foreign relief money went to purchase permanent homes for the desolated Sakurajima fugitives on the near-by island of Tanegashima.

Fifteen thousand people had dwelt within the death zone of the volcano. Seven out of eighteen villages on the island were destroyed. Fifteen lives were lost by earthquake in Kagoshima city and twenty others elsewhere. Probably ninety-five thousand people moved across country and were cared for by spontaneous hospitality (see page 462). The Japanese show the Oriental quality of nomads, content with few possessions, small papery houses and light, portable household goods.

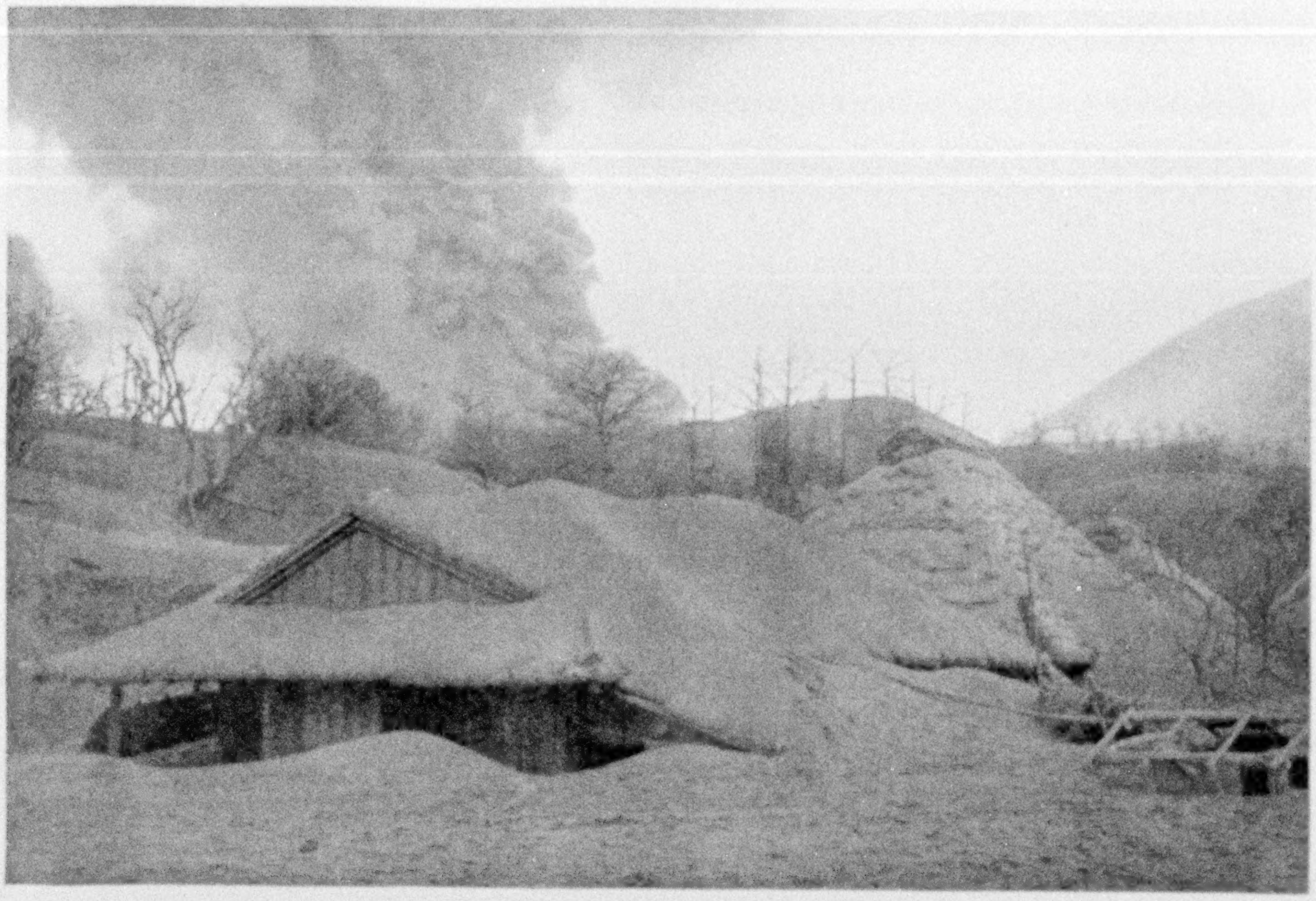
The ash fall varied in depth from 70



Photograph from T. A. Jaggar

ASH AND PUMICE AT KUROKAMI, NORTHEAST OF SAKURAJIMA

"The ash fall varied in depths from 70 inches, near the volcano, to a thin film 30 miles away" (see text, pages 466 and 468).



Photograph from T. A. Jaggar

A LESSON IN HOUSE-BUILDING FOR DWELLERS ON VOLCANOES

Flat roofs accumulate ash and generally collapse, while steep ones make a toboggan slide and the ash slips off (see text, page 455).

inches near the volcano to a thin film 30 miles away. On the second day (13th) it fell in Osaka, 350 miles to the northeast, and on the third day in Tokyo, 600 miles to the northeast.

More than 4,000 acres of hard lava, above sea-level, poured out in the first two months; 2,148 buildings were burned and 400 collapsed. The damage was estimated at $19,000,000, the number of people transferred to new homes was 28,096, the relief fund amounted to $2,500,000, and 18,446 destitutes were being provided for in February. There was much damage by ash and pumice that had to be removed from devastated districts still habitable.

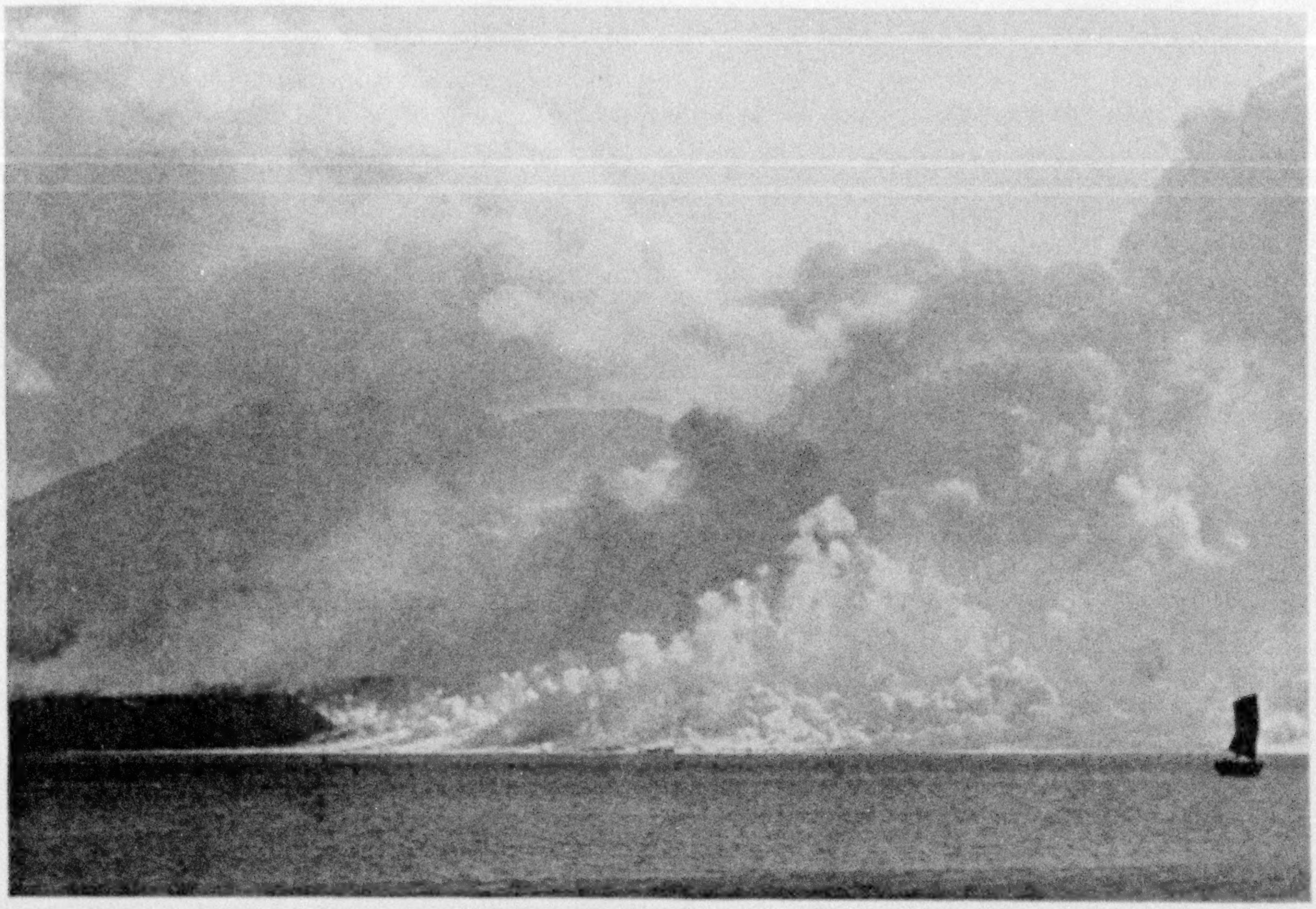
THE GROUND WAS HEAVED OR LOWERED

Careful measurements by engineers immediately after the Sakurajima eruption showed that a place on the mountain which was an old survey station had been heaved up 24 feet, and that a place in the bottom of the bay to the north had subsided 10 feet. These facts are interpreted to mean that the actual mountain was swollen by the lava inside, but that the land all around for a distance of 75 miles, more or less, had subsided, owing to the great volume of lava withdrawn from what otherwise would have been left as a void in the depths of the earth's crust.

Careful levelings have shown that such gradual subsidence, lessening at increasing distances from the volcanic center, actually occurred.

Similar heaving occurred in north Japan in 1910, when Usu volcano erupted, without, however, emitting any lava. A calculated tilting of the ground at these two volcanoes has shown that at Sakurajima a leveled slab would have tipped five minutes of arc, and at Usu about ten minutes. This means that at these two places a carefully built and plumbed pier in an astronomical observatory, if there had been such, would have been thrown out of plumb permanently by from a twelfth to a sixth of a degree.

Such heavings and shovings of great blocks of the earth's crust are common in earthquakes, and in the San Francisco



Photograph from T. A. Jaggar

FOURTH STAGE IN THE ADVANCE OF THE WESTERN LAVA FLOW

Karasu Island is being buried under lava, which, upon reaching the sea, makes millions of rising tails of cottony steam (see text, page 452).

disaster the sidewise movement between two adjacent pieces of ground was as much as fifteen feet. A great earthquake in Alaska in 1899 lifted the rocky shore line more than forty feet, as reported by a National Geographic Society expedition, which was sent to measure it.

COMPARISON WITH THE TOKYO EARTHQUAKE

The appalling cataclysm which has recently stricken Japan, destroying most of Yokohama and two-thirds of Tokyo (see pages 441-446, and 448), was occasioned by sudden big movements about the volcanic rift in the bottom of the sea a few miles southeast of Fujisan (Fujiyama).

The bottom of Sagami Bay sank 900 feet, as if a submarine crater had caved in. The sides of the bay slumped on the slopes and piled up along the bottom edge of those slopes, so as to change the soundings from 300 to 1,200 feet, in some places the depth being increased, in others lessened.

With all these colossal changes in the sea bottom, the solid shore lines were lifted and lowered by from one to nine feet only, indicating an upheaval and a tilting over a wide area affecting the entire cup surrounding Sagami Bay.

These relatively small figures for the shore lines indicate a difference in the materials composing the bottom of the bay and those of the shore line. Moreover, the subsidence of the middle of the bay was probably a slumping of blocks into the great volcanic rift of the Fuji chain of volcanoes.

On the other hand, the upheaval of eastern Japan for 100 miles outward from the volcanic center was probably due to some swelling action of the lava under the earth's crust. This lava failed to escape, just as in the case of Usu Volcano (see text, page 468), and so its energy was satisfied by a movement of inward swelling instead of outwelling, and elevation of the land was the result.

These movements of swelling and tilting have been studied attentively at the Hawaiian Volcano Observatory, under the United States Weather Bureau. For the man of science they have the advantage that they are going on all the time at active volcanoes and probably also in all earthquake belts; they reveal the actions of the lava underground, even when there is no lava to be seen above ground.

A HOPEFUL LINE OF RESEARCH

This is a very hopeful line of research, as the earthquakes are often accompanied by sudden tilts, and these tippings away from some point on the surface of the earth make that point a very suggestive, dramatic, and portentous place.

It all seems to suggest that such a center of tilting may become a center of sudden breaking or sudden volcanic explosion. In Hawaii the center is apt to be the middle crater of the volcanic system, and we have measured upheavals produced by an eruption which check perfectly with the rise and fall of the lava.

Contrasting the Sakurajima eruption with what happened at the Tokyo earthquake, the indications are that, in the former, there was an accumulated upward pressure, while tide gauges and anchorages at the stream mouths had shown for many years that the shore line of Kagoshima Bay was rising. Near Tokyo, on the other hand, there is good reason to believe that certain shore lines in the last few years have been sinking.

A wharfmaster on the Bōshu Peninsula, east of Tokyo, told me, during my investigations following the cataclysm of September, 1923, that for twenty years past the sea had been encroaching and had forced him to build a concrete wall. This means that the land beneath his wharf had been slowly going down. When the earthquake came that whole region was shoved up vertically; this man's wharf was wrecked and was left high and dry.

At Kagoshima Bay, when the Sakurajima eruption came and quantities of lava were poured out from underground, the whole shore line of the bay roundabout, which had been rising for twenty years, suddenly subsided several feet.

The difference in the phenomena accompanying the two events, it would seem, is that a volcanic eruption is the relief by outpouring of an accumulation of volcanic matter which for years has been pressing upward, whereas a great earthquake of the Tokyo-Yokohama kind may be a sudden upward pressure over a considerable area due to some expansion of volcanic matter underground which has previously been subsiding or contracting.

Whatever the facts, this doctrine for the great earthquake checks with the evidence that makes the earthquake center coincident with the Fuji belt of active volcanoes, where under Sagami Bay, the bottom sank 900 feet.

Furthermore, Dr. Omori's tables of earthquake frequency at Tokyo for the last twenty years show that there has been a steady dwindling in numbers of shocks registered each year by the seismographs.

It is only a question of time, and of making additional observations at several volcanoes, for science to learn more about earthquake portents than anyone dreamed of fifty years ago. The late honored Professor Omori was a martyr to science in the Tokyo earthquake. He devoted all the later years of his life to studying the relation of earthquakes to active volcanoes in Japan. He found that volcanoes were the keys to the earthquake problem. He had almost reached the point of unlocking the mystery. All honor to his memory, and may science take up the key where he laid it down.

Notice of change of address of your Geographic Magazine *should be received in the office of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your June number, the Society should be notified of your new address not later than May first.*

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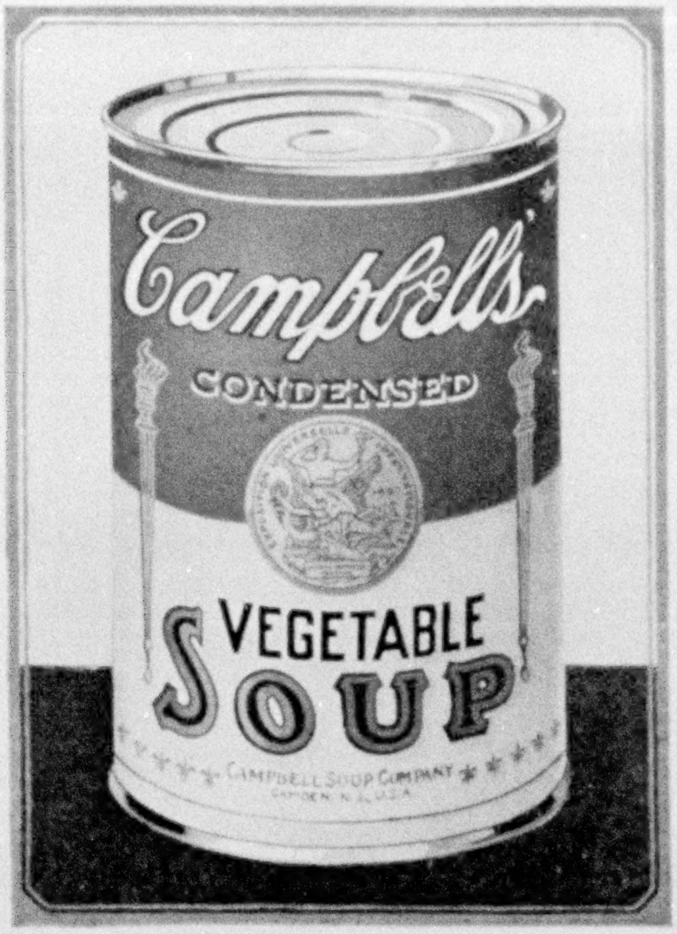
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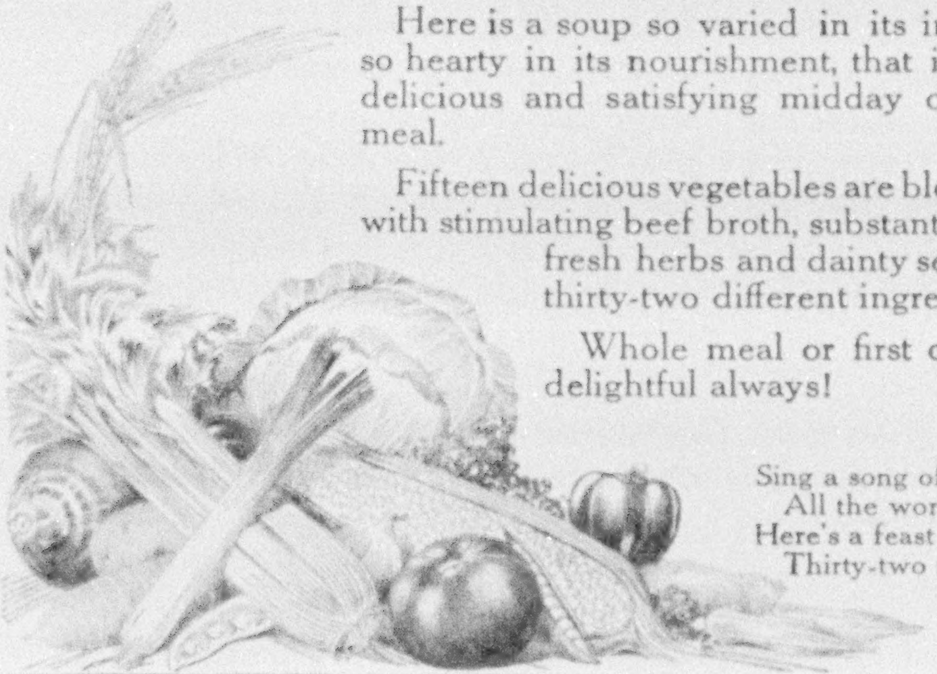

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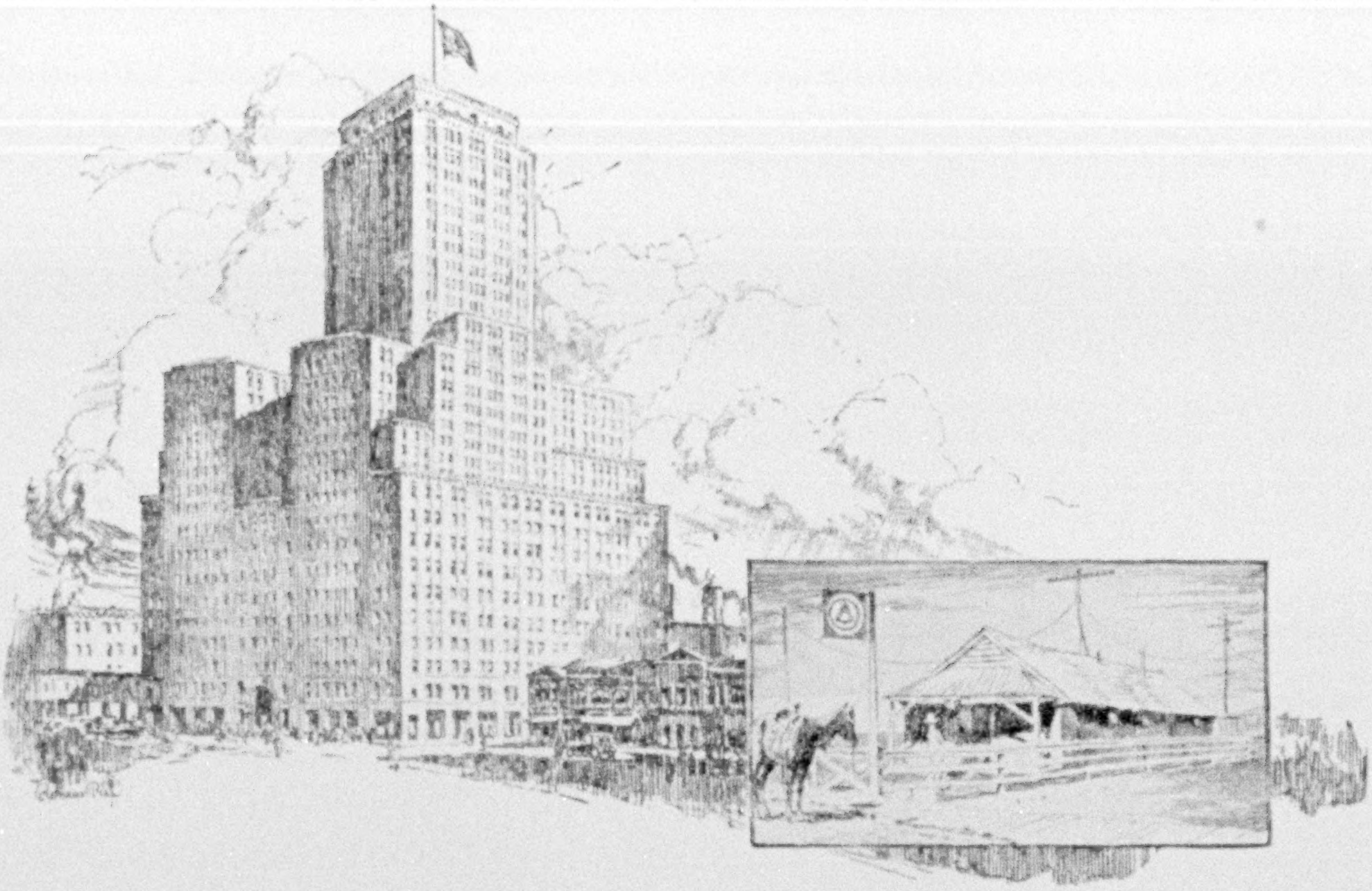

Each Serves Its Community

In Fraser, Colorado, a log cabin of three rooms shelters a telephone exchange that connects with the mountain homes of cowmen, miners, homesteaders and tie-cutters. In the heart of New York City a new building of twenty-nine stories is to become the home of several metropolitan central offices serving some 120,000 telephones. This building will contain, as well, offices for executives and for engineering, commercial, plant and accounting forces, providing space for over 7000 telephone workers.

Each of these buildings helps to render adequate and economical telephone service in its own community. They stand at the extremes in size, equipment and personnel. Yet they both indicate the nation-wide need for adequate housing of the activities of the Bell System; and they illustrate the varied ways in which that need is being met. One of the largest single items of plant investment of the Bell System is real estate, comprising nearly 1700 buildings acquired, with their sites, at a cost of $180,000,000.

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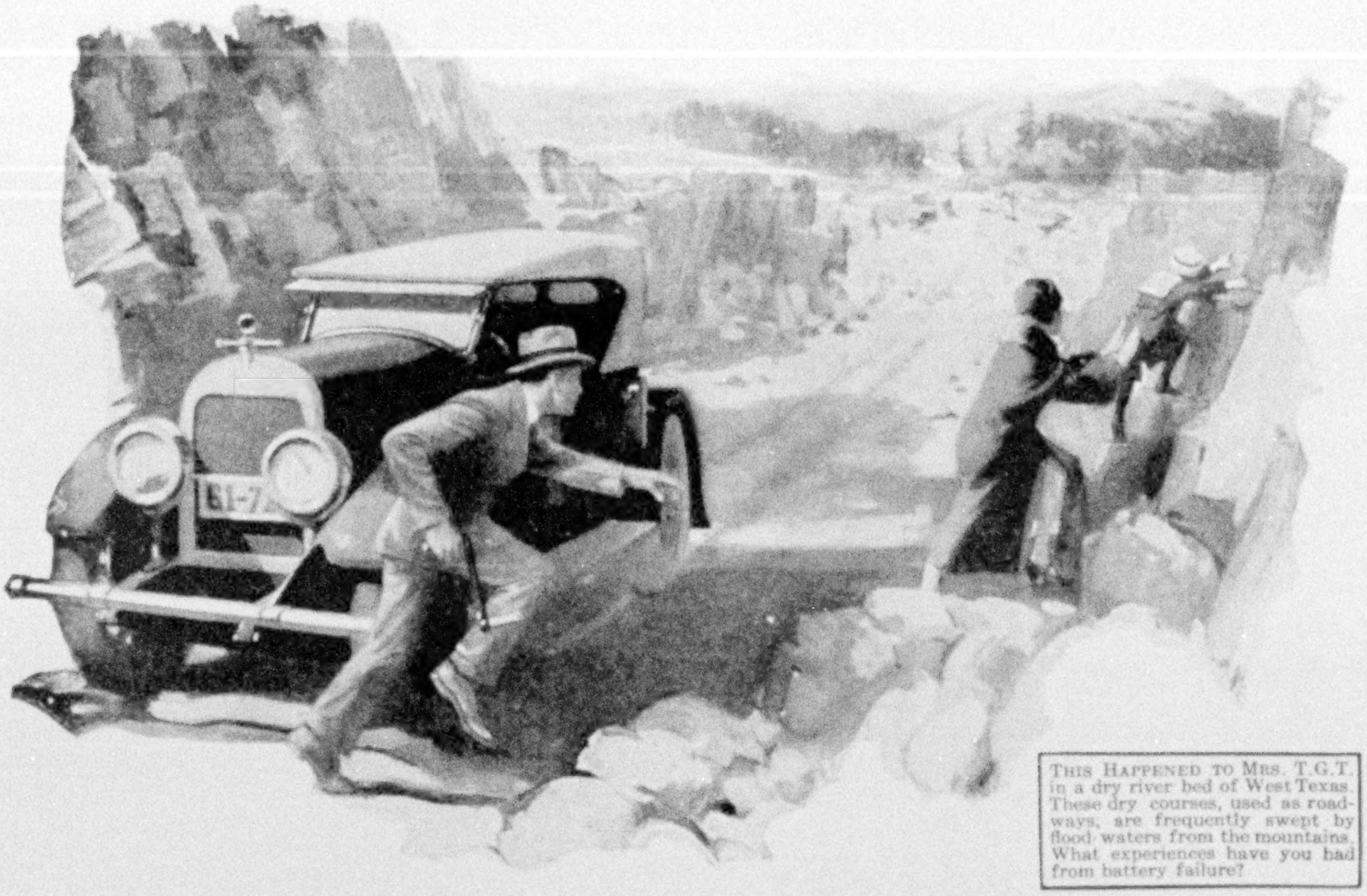
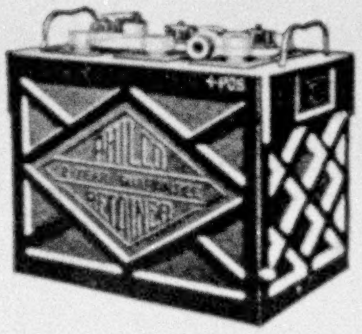


THIS HAPPENED TO MRS. T.G.T. in a dry river bed of West Texas. These dry courses, used as roadways, are frequently swept by flood waters from the mountains. What experiences have you had from battery failure?



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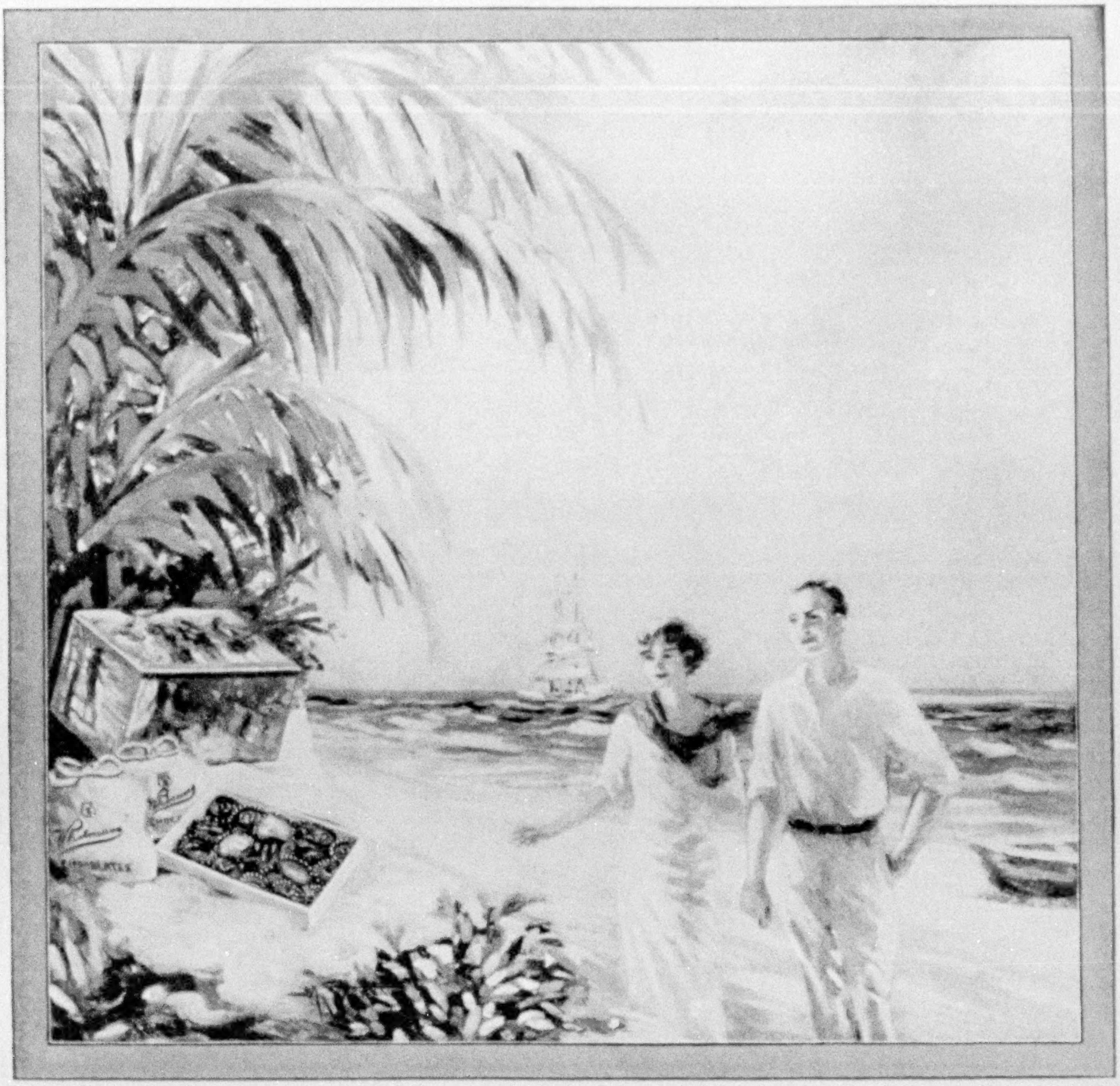

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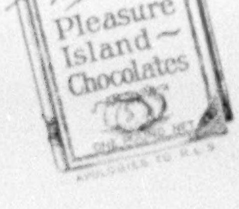

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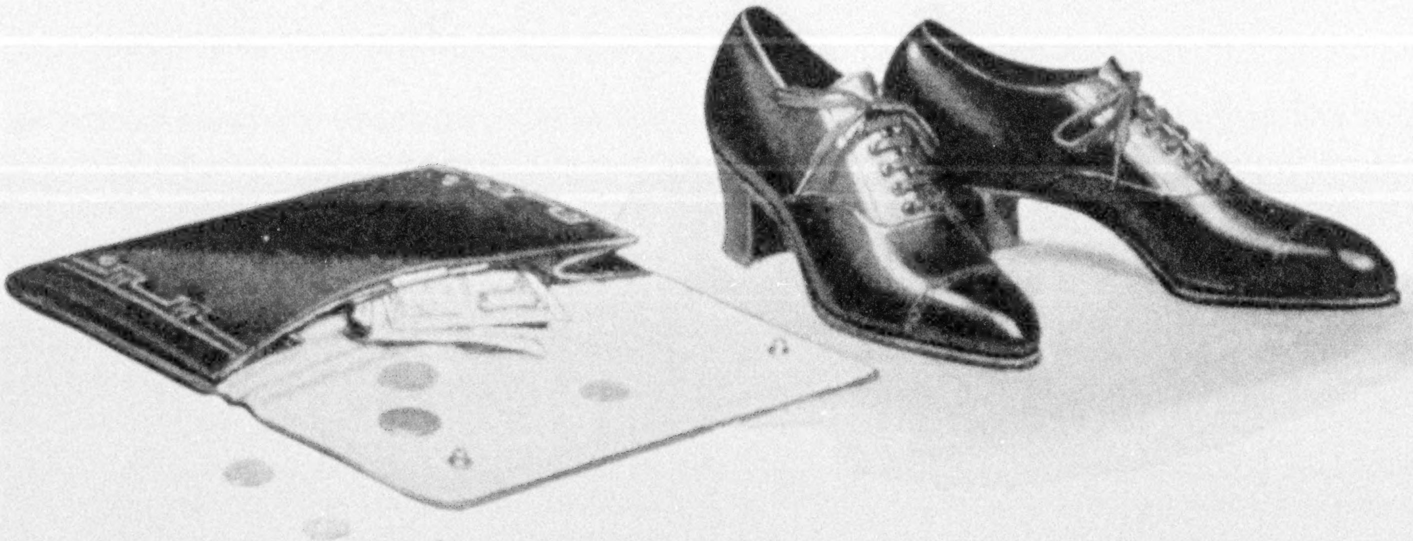

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Atlantic City—2019 Boardwalk (near Shelburne)
Baltimore—325 North Charles St. (2nd floor)
Binghamton—Parlor City Shoe Co.
Birmingham—219 North 19th St.
Boston—109 Newbury St. cor. Clarendon St.
Bridgeport—1025 Main St. (2nd floor)
Brooklyn—516 Fulton St. (Primrose Bldg.)
Buffalo—641 Main St. (above Chippewa St.)
Burlington, Vt.—Lewis & Blanchard Co.
Canton, O.—H. M. Horton Co.
Charlotte—226 North Tryon St.
Chicago—30 E. Randolph St. (Room 502)
1050 Leland (near Broadway)
835 E. 61st cor. Drexel Ave. (Woodlawn)
Cincinnati—The McAlpin Co.
Cleveland—1705 Euclid Ave.
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Dayton—The Rike-Kumler Co.
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Hartford—Trumbull & Church Sts.
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Indianapolis—L. S. Ayres & Co.
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St. Louis—516 Arcade Bldg. (opp. P. O.)
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San Diego—The Marston Co.
San Francisco—Phelan Bldg. (Arcade)
Schenectady—445 State St.
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Springfield, Mass.—Forbes & Wallace
Syracuse—121 West Jefferson St.
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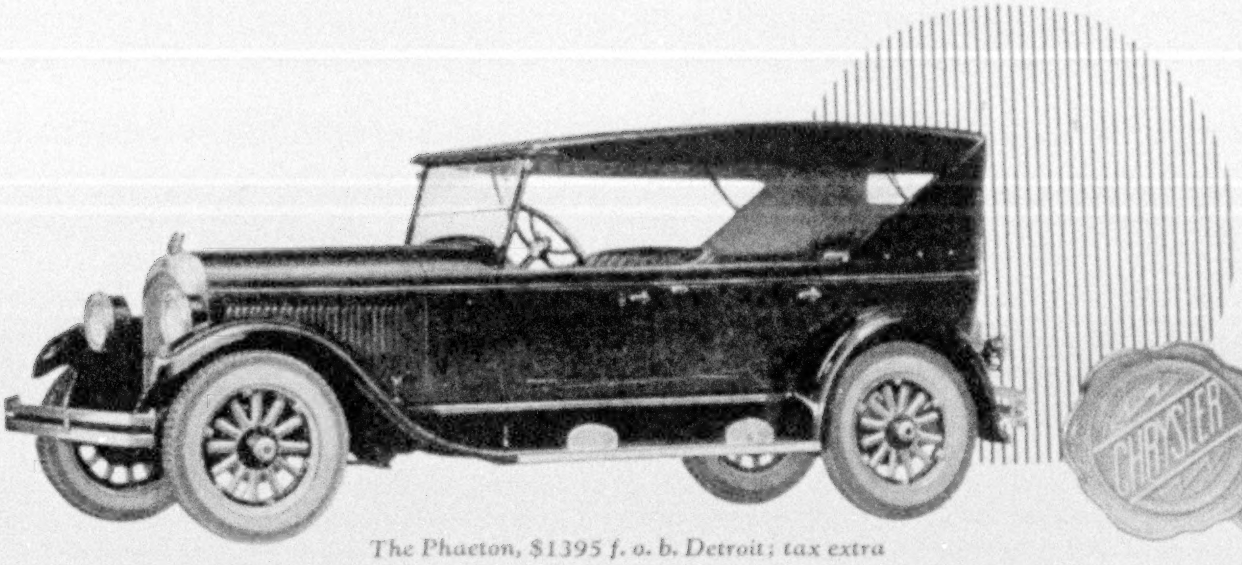

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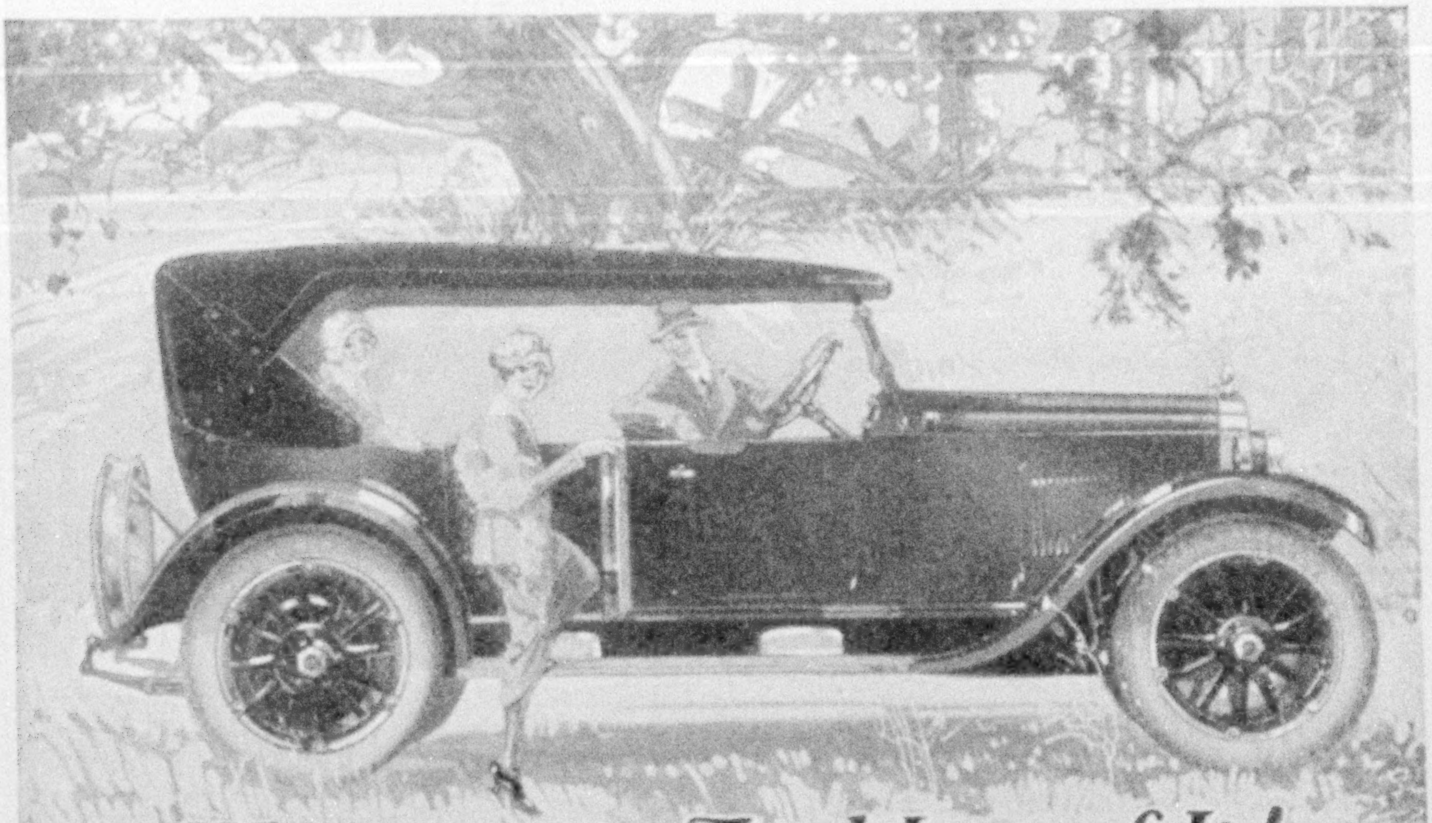

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"You Press the Button; We do the rest"

Ciné-Kodak for *Motion* Pictures

Press the button and the tiny motor in your Ciné-Kodak cranks the camera steadily and evenly. You hold and point the camera —that's all. Motion pictures of the children, of crucial moments in your favorite sport, of people and things that fit your fancy are as easy with the Ciné-Kodak as snap-shots now are with a Brownie.

Then, after Eastman experts have "done the rest," and your films are ready to run, turn the switch on your Kodascope and the 30 x 40 inch pictures are projected in motion in your own home.

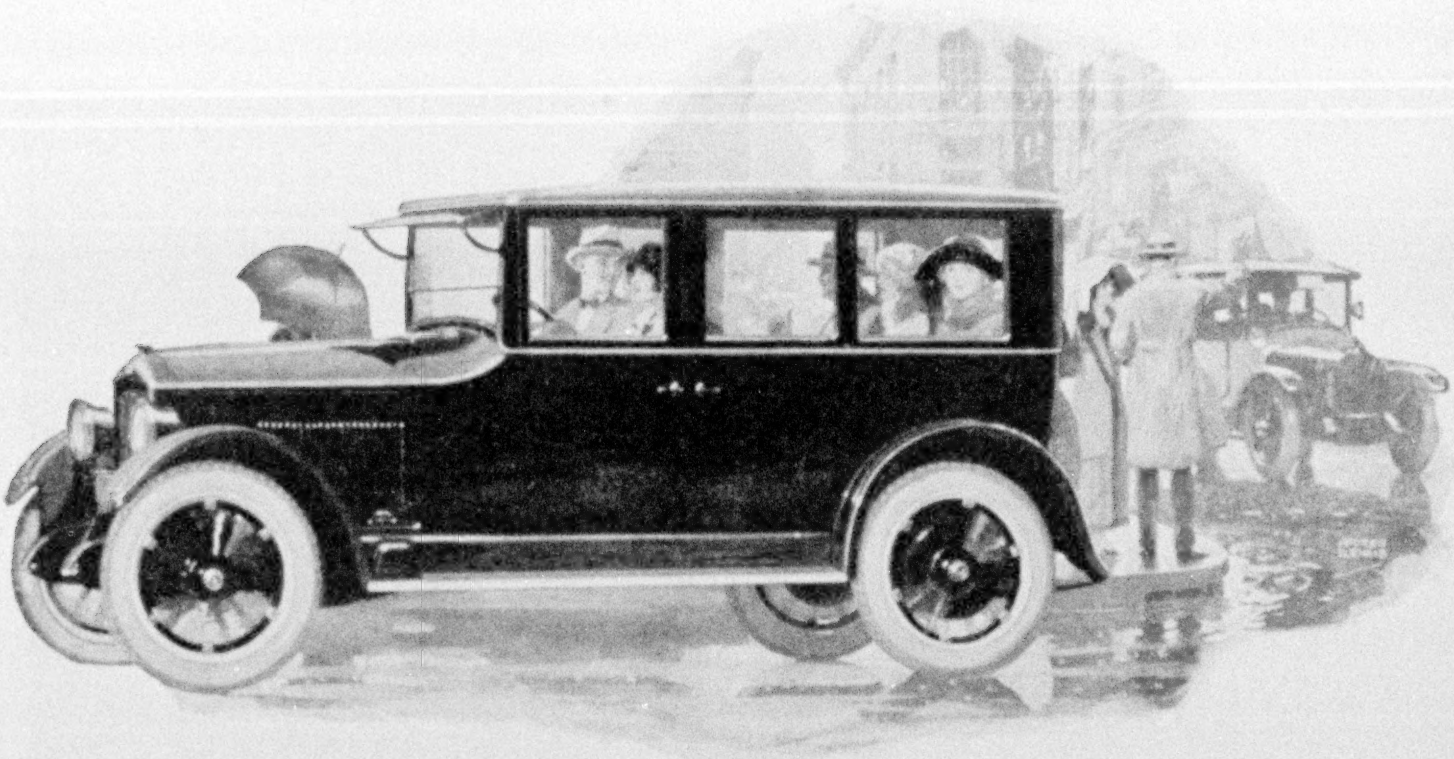
Nor are you confined to personal pictures. Through Kodascope Libraries, Inc., Charlie Chaplin comedies, dramas, educational reels and animated cartoons may be secured at a modest rental.

Price of complete outfit, including Ciné-Kodak with either motor drive or crank and tripod, Kodascope, Screen, etc., $335. The operating expense is less than 20 per cent of the operating expense of an outfit using standard width film. Many Kodak dealers now have the Ciné-Kodak in stock.

Descriptive booklet at any dealer's or from us

Eastman Kodak Company, Rochester, N. Y., *The Kodak City*

IN ALL THE WORLD NO CAR LIKE THIS



Enclosed Comfort—Joyous "Pep"

CONSIDER the fun your family could have with this Jewett Sedan. Independence of travel, day or night—and year 'round comfort, too. Windows adjust easily, according to the season. Snug in winter, open and cool as a touring car in summer. Seats five adults in restful ease. Inviting cushions; upholstery is fawn-colored velour.

Being a Jewett, this sedan has "open car" performance. Goes from 2 to 60 miles an hour, or more, in high. Takes most any hill in high—accelerates from 5 to 25 miles an hour in 7 seconds, in high!

Jewett's full 50 h.p. motor *stays good* for it is high-pressure oiled like the big Paige and other top quality cars. Two gallons of oil per minute are forced through all main bearings and connecting-rod bearings. Paige-Timken axles, front and rear; all-steel universal joints. Jewett's 6-inch-deep frame insures long car life.

Jewett is convenient in size. Parks in a 16½ foot space at the curb; turns in a 42-foot street; enters or leaves your garage on but a 14-foot alley.

Jewett steers with finger-touch guidance, due to ball-bearing steering spindles. Women love the quiet gear-shifting, the gentle Paige-type clutch. Think of changing from high to second at 30 miles an hour—quietly!

In all the world no car like this. Jewett combines mechanical superiorities and advantages no other car possesses. It is approached only by cars costing $700 to thousands more—and then at the sacrifice of economy and convenience. The nearby Jewett dealer will gladly let you drive the Jewett. (609)

Touring	$1065	Sedan	$1495	De Luxe Touring	$1220
Brougham	1325	Coupe	1250	De Luxe Sedan	1695

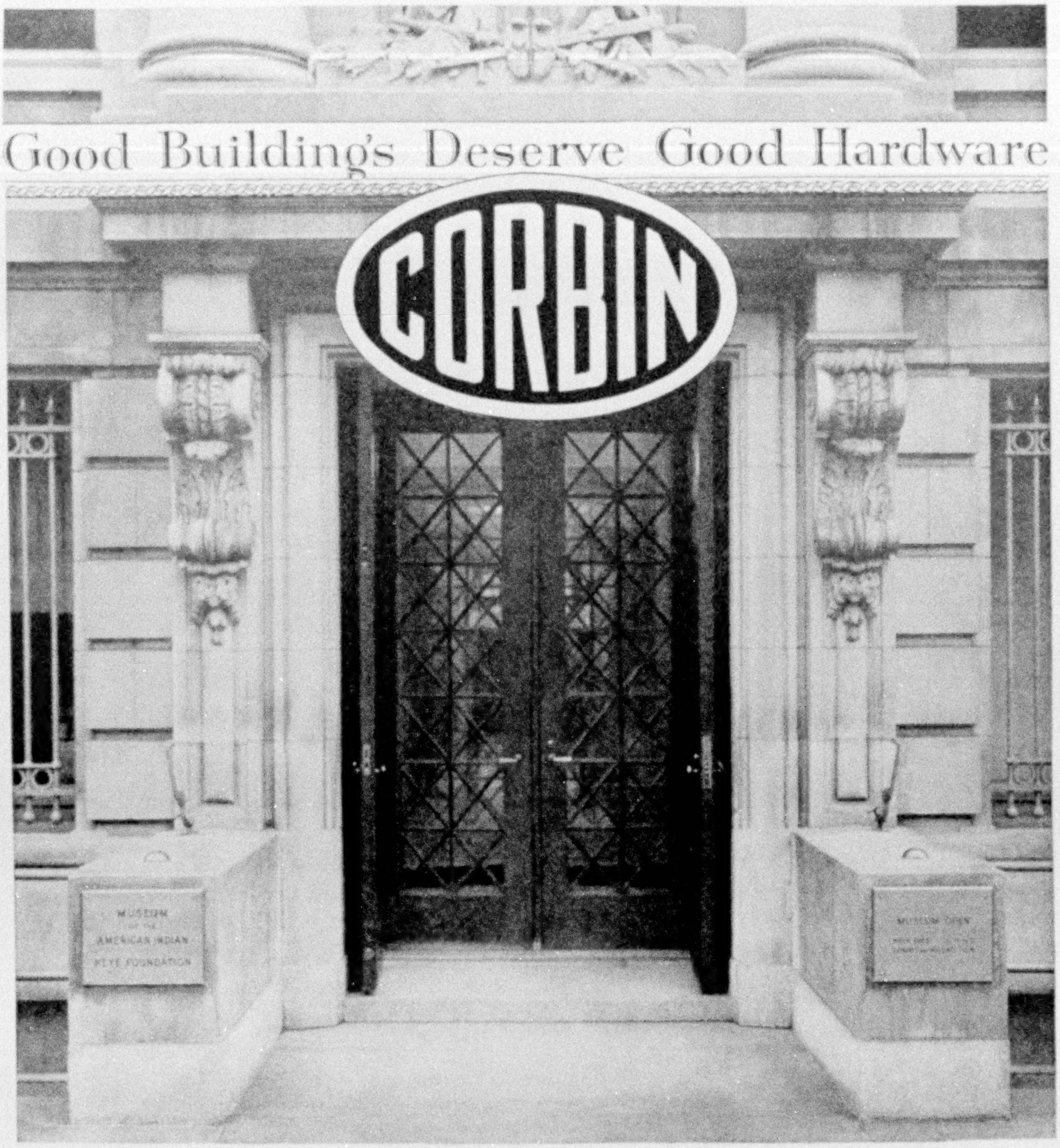
Prices at Detroit. Tax Extra

JEWETT SIX

PAIGE BUILT

Good Buildings Deserve Good Hardware

CORBIN



The Museum of the American Indian, New York

EVERY building that has Good Hardware has a higher valuation out of all proportion to the slightly higher first cost of Good Hardware.

Why is this true? Because hardware, although often overlooked as a minor detail of construction, cannot be overlooked after the building is occupied.

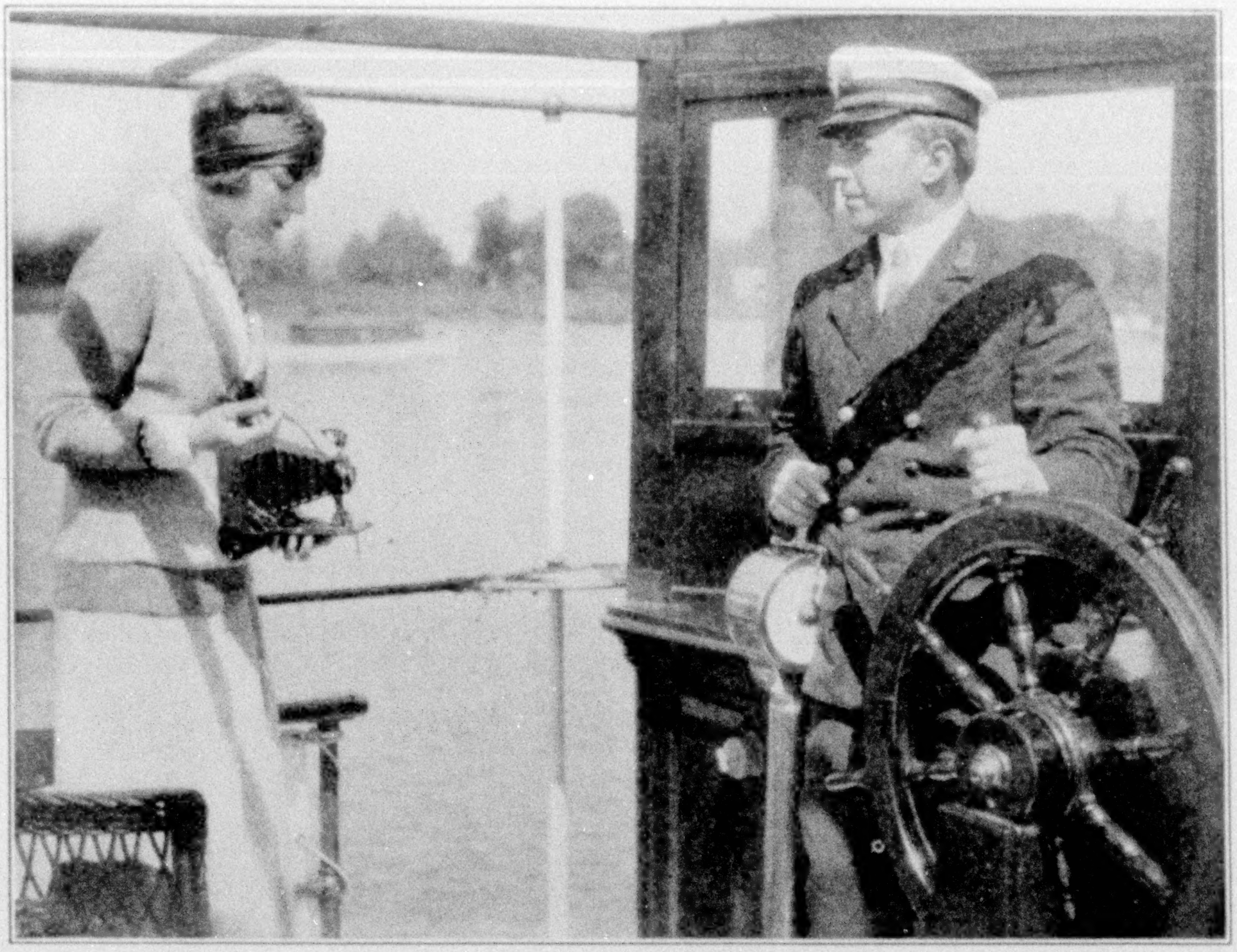
The lock on a door is the focal point of a door. It is the first thing seen and touched. Hardware forms the connecting link between the structure and you, who use it. It operates and controls all the moving parts of the building.

Good hardware enters into your everyday life as a hundred willing servants, unobtrusive, silent, aiding at every turn your goings and comings, your ventilation, your comfort, convenience and security.

If you would like to know more about good hardware, write for our illustrated booklet "Good Buildings Deserve Good Hardware."

P. & F. CORBIN SINCE 1849 NEW BRITAIN CONNECTICUT
The American Hardware Corporation, Successor
NEW YORK CHICAGO PHILADELPHIA

The crude abode of the Indians comprehended only the present. Civilized man plans and builds for the future.



Kodak Keeps the Story

Just "click" the shutter of this easily-worked camera and to-day's good times become to-morrow's good pictures.

Autographic Kodaks *$6.50 up*

At your dealer's

Eastman Kodak Company, Rochester, N.Y., *The Kodak City*

Seeger Original Siphon Refrigerators are generally accepted as the

Standard of the American Home

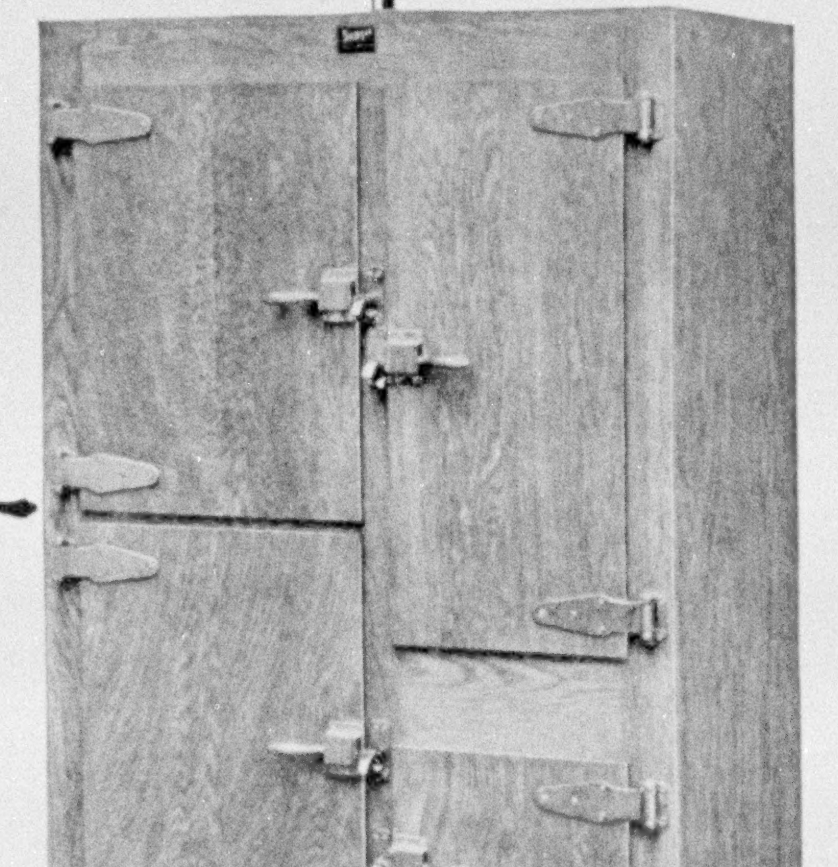
They are built for either ice or electrical refrigeration, without alteration.

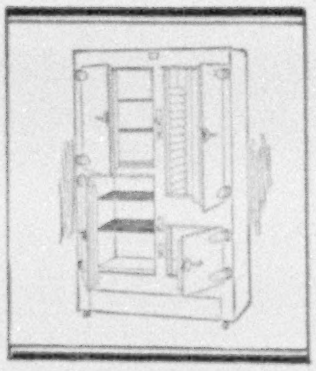
A representative dealer may be found in every city.

Seeger Refrigerator Company
Saint Paul - - - - Minn.

Branches:
399 Madison Avenue - - - New York City
80 Washington Street - - - Boston, Mass.
666 Lake Shore Drive - - - Chicago, Ill.
2433 Hunter Street - - Los Angeles, Calif.

Seeger
Original Siphon
Refrigerators





The Loveliness of Glistening Teeth

BEAUTIFUL teeth are your priceless gift from Nature. Keep them beautiful and healthy by "washing" them with Colgate's.

Colgate's Ribbon Dental Cream is a safe, modern dentifrice that "washes" and polishes, does not scratch or scour. It contains no grit, for grit scratches thin tooth enamel.

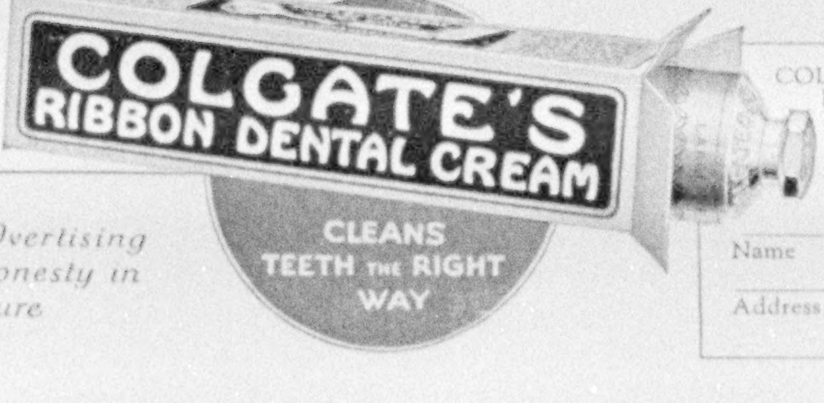
The Colgate method makes teeth glisten. The non-gritty chalk in Colgate's loosens clinging food particles that might ferment and cause decay. Mild vegetable-oil soap gently washes these particles away.

No curative claims are made for Colgate's, for a dentifrice should be a cleanser, not a "cure all."* Your Dentist, not your dentifrice, should treat unhealthy mouth conditions.

Large tube—25c. Or, if you prefer a sample, fill out and mail the coupon below.

**A Dentist recently wrote: "There are no 'cure-alls' in dentifrices. They are only cleansing agents performing the same function in the oral cavity that soap and water do for the hands. I heartily endorse Colgate's as one of the very best in the market."*

COLGATE & CO.
Established 1806



Truth in advertising implies honesty in manufacture

COLGATE & CO.
Dept. 66 199 Fulton Street
New York City
Please send me, free, a trial tube of Ribbon Dental Cream.

Name __________

Address __________
(Write in Margin)

A MUTUAL ORGANIZATION—FOUNDED IN 1845

New York Life Insurance Co.

(Incorporated under the Laws of New York)

346 BROADWAY, NEW YORK, N. Y.

Seventy-Ninth Annual Statement

TO THE POLICY-HOLDERS:

As a policy-holder you are chiefly interested in the quality of your Company and in the service it renders. By "quality" I mean the character of its business; the grade of its securities; the standards maintained by its Executive Officers.

I can not paint a complete picture, but in order to drive home some of the truth I give you below a picture of the work of **one Committee** during the year 1923.

During 1923 the Finance Committee made the following investments:

BONDS PURCHASED	Cost	Average Yield
U. S. Government Treasury Notes	$11,013,860.00	4.65%
Domestic Railroad Bonds	13,569,960.00	5.44%
Domestic Municipal Bonds	4,050,912.00	5.02%
Domestic Public Utility Bonds	9,216,596.00	5.49%
Canadian Municipal Bonds	494,700.00	5.24%
British and Other Foreign Bonds	5,470,312.00	5.14%
Total	**$43,816,340.00**	**5.17%**
BOND AND MORTGAGE LOANS MADE		
City Loans	$59,262,432.00	5.81%
Residential Loans	10,002,094.00	5.80%
Farm Loans	18,097,561.00	5.38%
Total	**$87,362,087.00**	**5.72%**
Bonds Bought and B. & M. Loans made	**$131,178,427.00**	**5.54%**
B. & M. Loans renewed	$12,991,730.00	5.50%
Total	**$144,170,157.00**	**5.53%**

This total—**$144,000,000.00**—was much more than our net income. The Committee believed it saw an opportunity to benefit you through selling and reinvesting, without risk, in order to increase the earning power of invested assets. They therefore sold Bonds amounting to (par value) **$44,845,459.29** during the year, of which **$33,182,900.00** were United States Government Bonds. By this process, and by transferring of certain foreign bonds, in reinsuring foreign business, they increased the earning power of Ledger Assets by over **$1,000,000.00** annually for **an average of nine years.**

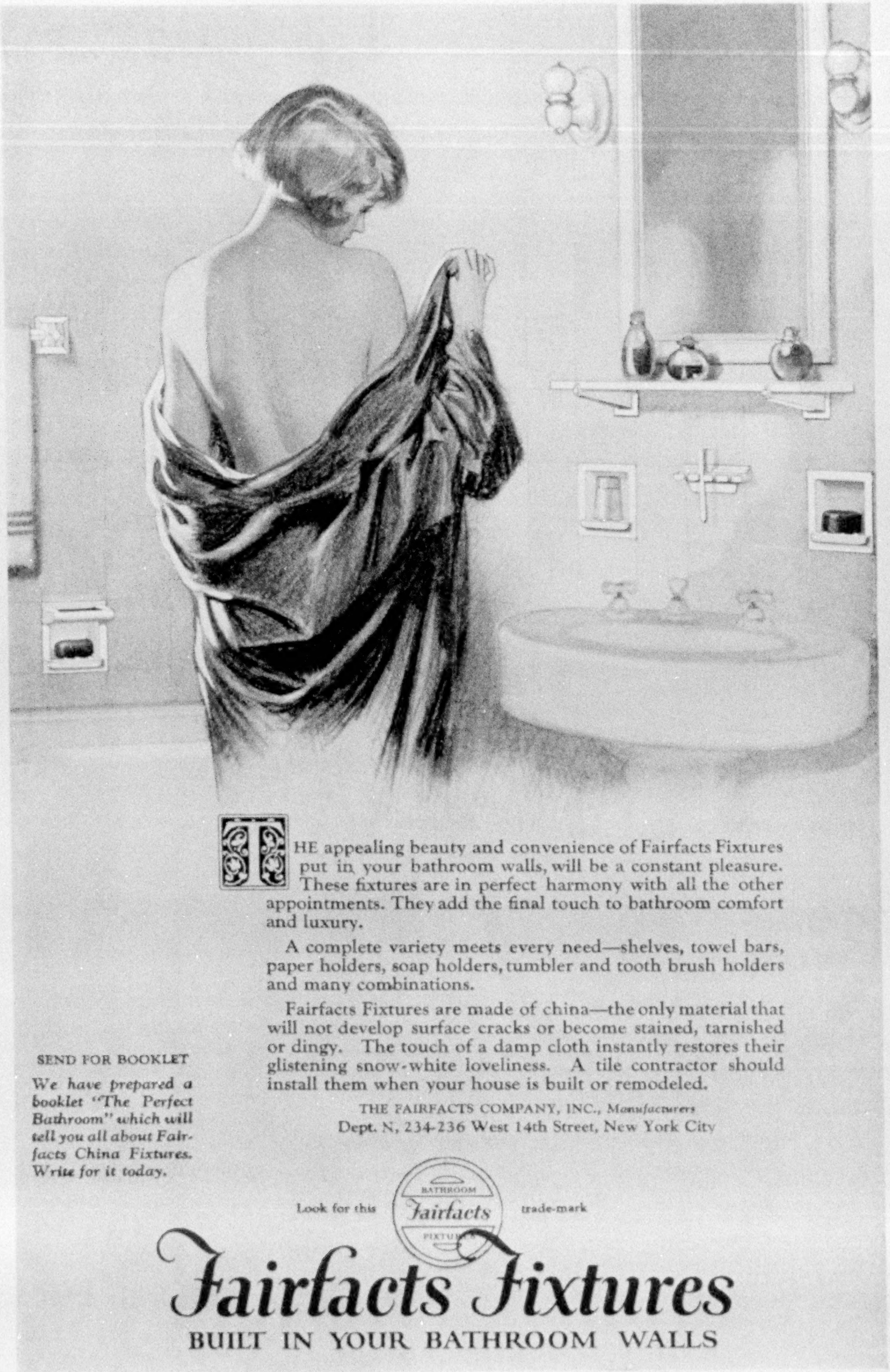
In addition to the Finance Committee we have five other standing committees and several sub-committees. They all work. The standing committees make detailed reports to the Board of Directors monthly. The members of the Board are in close touch with matters of fact as well as matters of policy.

The new business in 1923 was	**$693,059,800.00**
The gain in outstanding insurance was	**$334,560,146.00**
The total insurance outstanding is	**$4,376,729,804.00**
The admitted assets, at **market values,** aggregate	**$1,003,773,762.46**
The liabilities amount to	**$859,107,391.41**
Dividends apportioned payable 1924	**$54,800,321.47**
Set aside for dividends under deferred dividend policies	**$20,352,917.00**
General Contingency Funds	**$69,513,132.58**

We have **125** Branch Offices in the United States and Canada, to which over **8,000** agents report.

DARWIN P. KINGSLEY, *President.*

Since Organization the Company has paid to and on account of Policy-holders and Beneficiaries over $2,000,000,000.00



THE appealing beauty and convenience of Fairfacts Fixtures put in your bathroom walls, will be a constant pleasure. These fixtures are in perfect harmony with all the other appointments. They add the final touch to bathroom comfort and luxury.

A complete variety meets every need—shelves, towel bars, paper holders, soap holders, tumbler and tooth brush holders and many combinations.

Fairfacts Fixtures are made of china—the only material that will not develop surface cracks or become stained, tarnished or dingy. The touch of a damp cloth instantly restores their glistening snow-white loveliness. A tile contractor should install them when your house is built or remodeled.

THE FAIRFACTS COMPANY, INC., *Manufacturers*
Dept. N, 234-236 West 14th Street, New York City

SEND FOR BOOKLET

We have prepared a booklet "The Perfect Bathroom" which will tell you all about Fairfacts China Fixtures. Write for it today.

Look for this BATHROOM *Fairfacts* FIXTURES trade-mark

Fairfacts Fixtures

BUILT IN YOUR BATHROOM WALLS

XUM

Your Home Deserves a Beautiful Entrance and Surroundings

The entrance, being the most distinctive feature of your home, deserves careful consideration.

Our 25 years' experience as America's largest designers and makers of beautiful entrances, Pergolas, Rose Arbors, Lattice Fences, Lawn Umbrellas, Gazing Globes, Sun Dials, Artificial Stone Bird Baths, Fountains and Flower Vases, means much to you.

We can reproduce the entrance shown, and many others of rare beauty, using our famous Koll Lock-Joint Columns. We guarantee architectural correctness, finest materials, and positive permanence of construction.

Send 30c for catalog No. N 34, featuring Garden Equipment, or send 20c for catalog No. N 47, featuring Koll Lock-Joint Columns. Both books are filled with illustrations and suggestions.

HARTMANN-SANDERS CO.,
2187 Elston Ave., Chicago, Ill.
Showroom: 6 E. 39th St., New York City.

HARTMANN-SANDERS

Koll Lock-Joint Columns—Pergolas—Rose Arbors
Garden Furniture and Accessories

KOLL LOCK-JOINT COLUMN

THEY CANNOT COME APART

The Tucker-Rice porch shown is now in Essex Institute garden. It was erected in 1800, being evolved by Samuel McIntyre, Salem, Mass.

High School Course in Two Years

This simplified, complete High School Course—specially prepared for home study by leading professors—meets all requirements for entrance to college and the leading professions.

30 Other Courses

Whether you need High School training or specialized instruction in any trade or profession the American School can help you. Check and mail coupon for Free Bulletin.

American School
Drexel Ave. and 58th Street
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Send me full information on the subject checked and how you will help me win success.

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Building Contractor
........Automobile Engineer
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........Structural Engineer
........Business Manager
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........Accountant and Auditor
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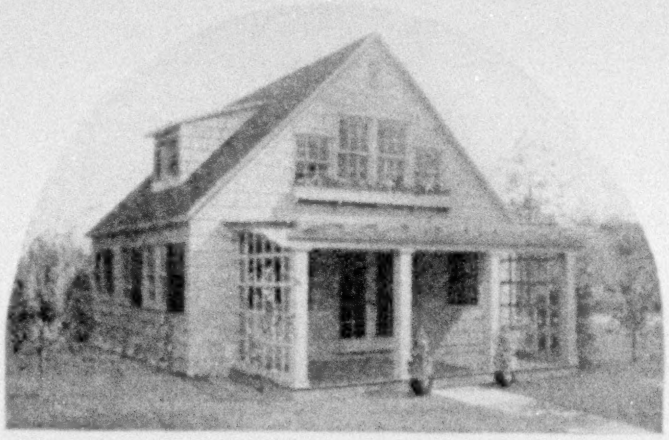
........Draftsman and Designer
........Electrical Engineer
........Electric Light & Power
........General Education
........Vocational Guidance
........Business Law
........Lawyer
........Machine Shop Practice
........Photoplay Writer
........Mechanical Engineer
........Shop Superintendent
........Employment Manager
........Steam Engineer
........Foremanship
........Sanitary Engineer
........Surveyor (and Mapping)
........Telephone Engineer
........Telegraph Engineer
........High School Graduate
........Fire Insurance Expert
........Wireless Radio
........Undecided

Name ....

Address ....



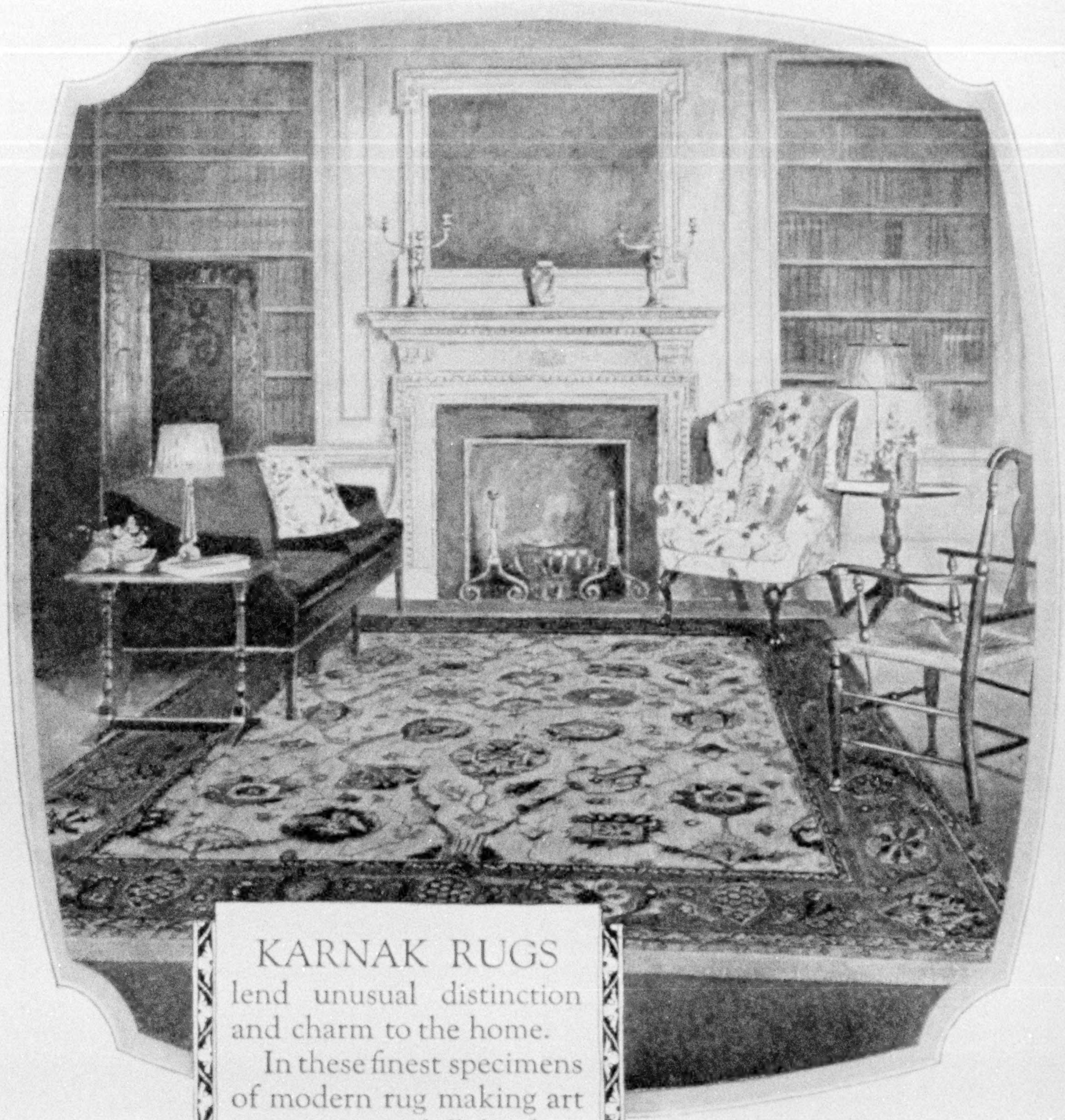
This Delightful Home

can be yours at a remarkably low price. The Bossert "Ready-Cut" method is the modern way of home-building that saves materially on the usual cost of erecting.

Bossert furnishes the plans, lumber, millwork, plaster-board, hardware, paint and varnish. Bossert gives you a better house for less money.

Send 20c for catalog showing a variety of Bossert designs.

LOUIS BOSSERT & SONS, Inc.
1313 Grand St. Brooklyn, N. Y.



KARNAK RUGS

lend unusual distinction and charm to the home.

In these finest specimens of modern rug making art are perpetuated all the character, beauty and durability for which the creations of the ancient tribes of Persia and India were famous.

See Karnaks at the better stores

Look for the woven Karnak name and the black and gold silk guarantee label on the back of the rug.

Write for booklet containing suggestions for beautifying the home. Illustrated with color photographs of interiors and full color reproductions of Karnak Rugs.

MOHAWK CARPET MILLS, Inc.

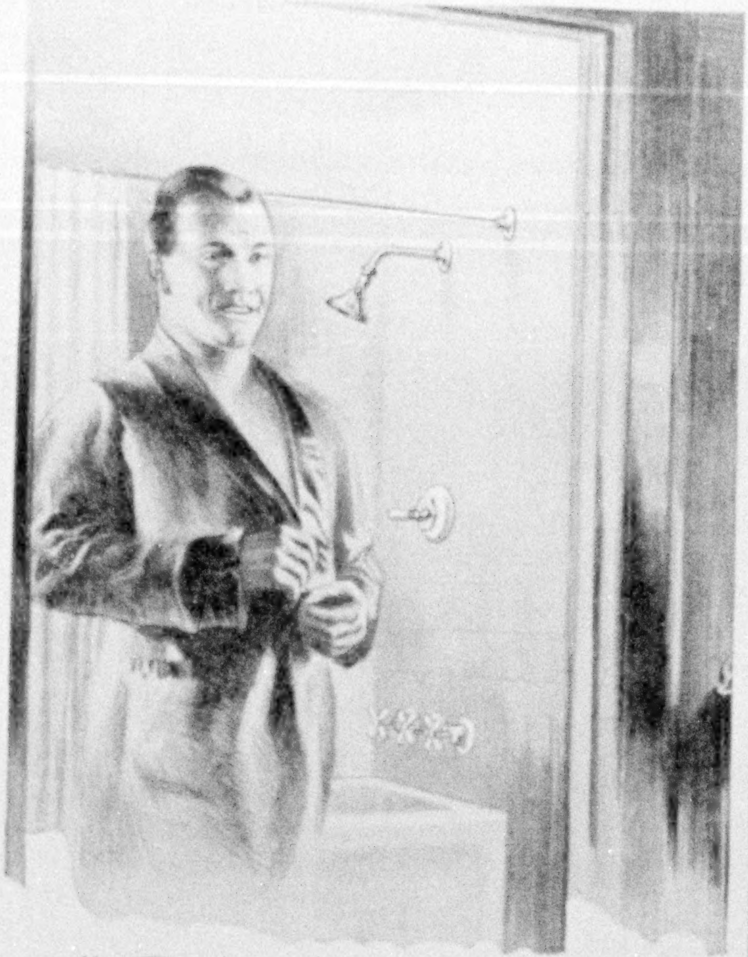
Manufacturers of Rosslyn, Glendale and highest quality Chenille carpets and rugs.

W. & J. SLOANE,
Selling Agents
581 FIFTH AVENUE, NEW YORK

KARNAK
RUGS

The aristocrat of American Wiltons

XUM



"Just had my shower—feel simply great"

"HAVEN'T missed my morning shower bath since the shower was installed—matter of fact, there's no need to miss it—the shower takes only a couple of minutes. Afterwards I surely do feel on my toes, full of pep. Why, when I get to the office I am two hours ahead of the clock."

But then he is not the only member of the family who enjoys the shower—everybody does—the children, too, soon learn to take *cold* baths, especially when you allow them to regulate the water themselves.

Cold baths incidentally build up a resistance against colds.

And for mother the shower means, among other things, the elimination of that back-tiring bending over the tub.

We have a booklet "Once-Used Water" showing showers for all homes and incomes. In sending for this booklet we will appreciate it if you mention your plumber's name.

SPEAKMAN COMPANY
WILMINGTON, DELAWARE

SPEAKMAN SHOWERS
THE MODERN BATH ROOM HAS A SHOWER

ROYAL MAIL
"The Comfort Route"

ROYAL MAIL
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NORWAY CRUISE

By the Luxurious "ARAGUAYA"

A WONDERFUL summer cruise to the fascinating lands of the Midnight Sun. Glorious days among the giant fjords. Visits to the North Cape, excursions to Lapp encampments, old Norwegian towns and the capitals of Norway, Denmark, Sweden and Holland. Delightful accommodations with every travel comfort on the palatial ARAGUAYA, 17,500 tons displacement. Rates including return to New York $500 up.

Sailing from New York—July 5th

EUROPE

Travel by the famous "O" steamers of the Royal Mail. De Luxe accommodations on the magnificent new OHIO. Comfortable moderate priced rooms on the one class cabin liners ORCA, ORDUNA and ORBITA.

A new summer service from New York to England, Ireland and Scotland by the popular cabin liner ORDUNA. First sailing May 31st.

CHERBOURG SOUTHAMPTON HAMBURG
PLYMOUTH BELFAST GREENOCK

Write for illustrated booklets.

THE ROYAL MAIL STEAM PACKET CO.

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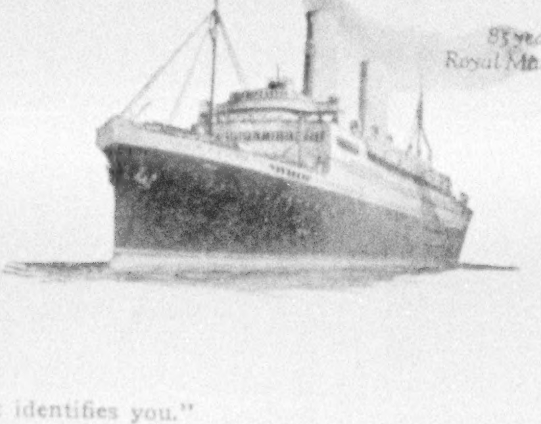
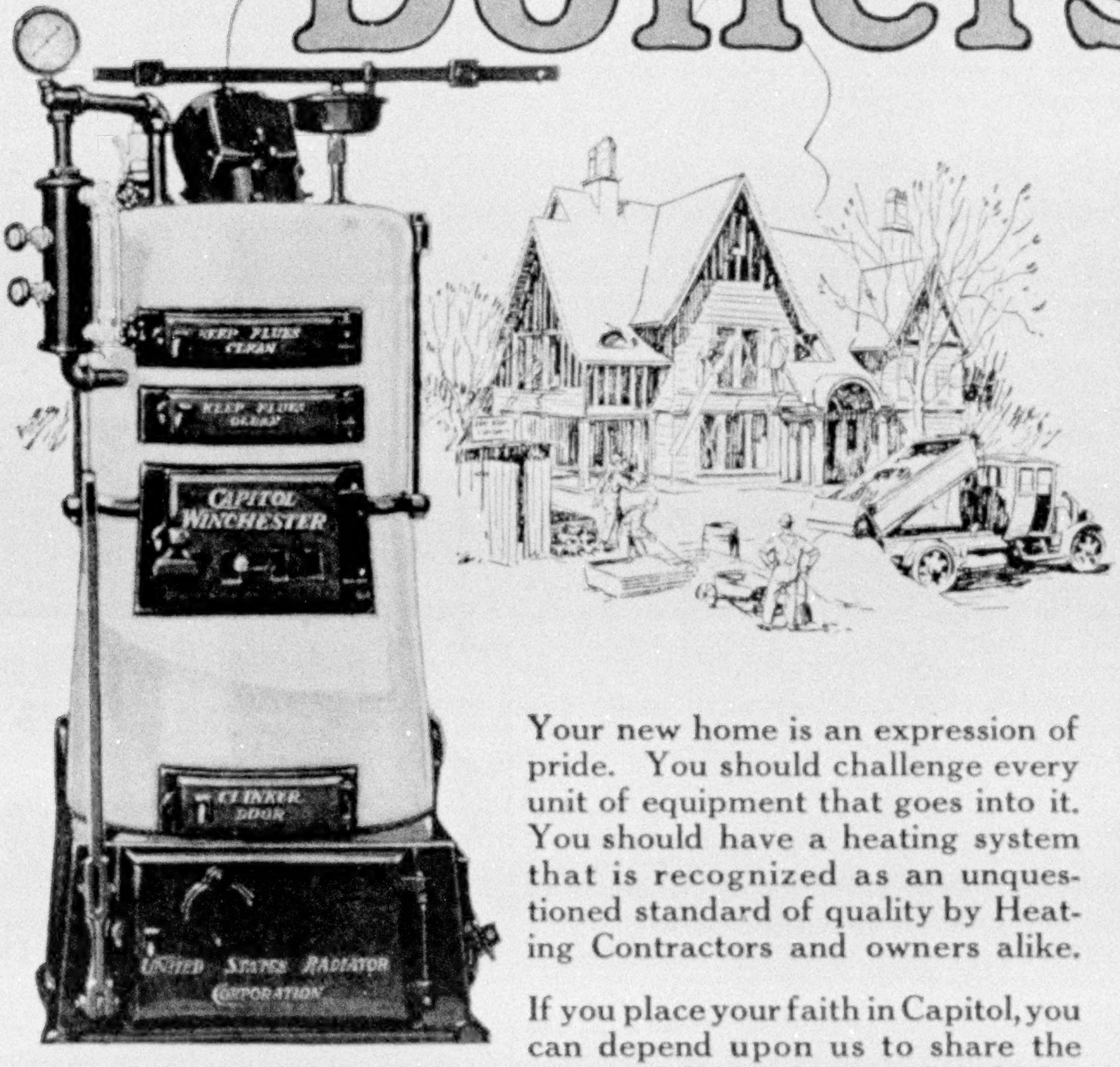


85 years of Royal Mail Service

Capitol Boilers


KEEP FLUES CLEAN
KEEP FLUES CLEAN
CAPITOL WINCHESTER
CLINKER DOOR
UNITED STATES RADIATOR CORPORATION

Your new home is an expression of pride. You should challenge every unit of equipment that goes into it. You should have a heating system that is recognized as an unquestioned standard of quality by Heating Contractors and owners alike.

If you place your faith in Capitol, you can depend upon us to share the responsibility with you. Any boiler with that name-plate *must* satisfy you or it cannot possibly satisfy us. Such has been our business policy for thirty years.

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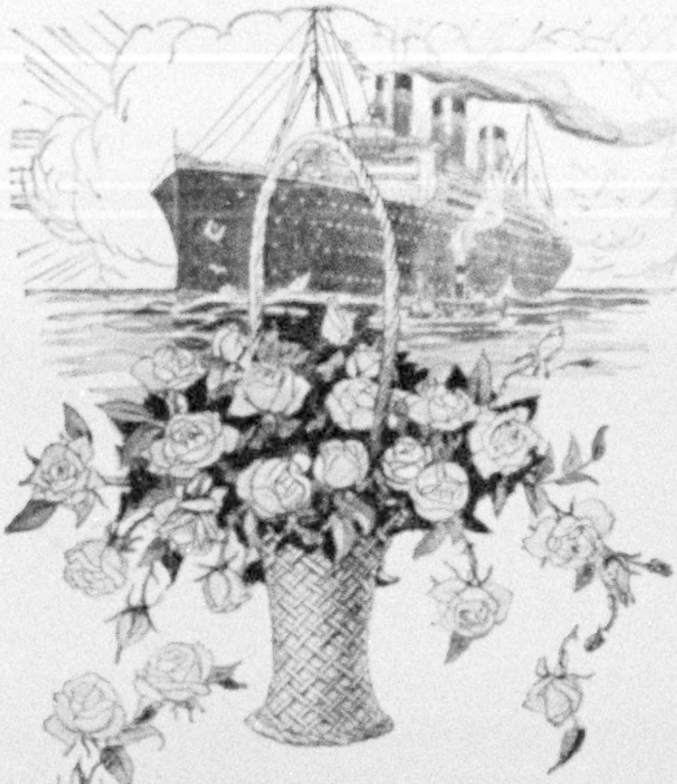

FLOWERS—to your Friends on outgoing steamers, to last all the way across. · · For openings of banks, business houses, offices, etc. to last a week.

For Birthdays, Anniversaries, Weddings and Receptions. Flowers for every other occasion. Write for our gift catalog with illustrations in natural colors, and our current price-list.

We deliver Flowers anywhere in New York or surroundings within 2 hours. Connections in every city and every port in the world—Able representatives to whom we can transfer your order by wire or cable, to be filled with scrupulous care at a moment's notice.

MAX SCHLING INC

"THE Telegraph Florist of New York"

785 FIFTH AVE. at 60th St

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THE VOSE GRAND represents over 70 years of experience devoted to the attainment of an ideal. Its incomparable tone brings a lifetime of satisfaction to the lover of good music.

We Challenge Comparisons

Write for our beautifully illustrated catalog and floor pattern of the Vose Grand, also our easy payment plan.

Vose & Sons Piano Co., 146 Boylston St., Boston

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ESCORTED TOURS TO

"Europe 1924"

Under the Experienced Management of the

American Express Travel Dept.

Planned and conducted by experts, these tours offer delightful Summer Travels abroad. Interesting itineraries, varied as to time, places and costs.

STANDARD TOURS—high grade—unusually appealing itineraries—66 days—$1495. Sailings every Wednesday and Saturday, May 28th to July 16th. Via the **MEDITERRANEAN**, June-July. SPAIN, the FRENCH RIVIERA and ITALY, sailings in March and April. Ask for Booklet "**Europe 1924.**"

6 WEEKS' VACATION TOURS—$610. Sailings every Saturday beginning June 7th. *Special Booklet.*

ANNUAL STUDENTS' TOURS—July 2nd to September 1st. *Special Booklet.*

UNIQUE TOUR TO SCANDINAVIA—July 5th to September 1st. *Special Booklet.*

VARIED TOURS from **LONDON** and **PARIS**. *Special Booklet.*

EUCHARISTIC CONGRESS—Amsterdam in July—with pilgrimages to Rome, Lourdes, Ireland. *Special Booklet.*

INDEPENDENT TOURS—to Europe at any time. All details arranged. *Booklet.*

DOMESTIC TOURS—Conducted or Independent—United States, Canada, West Indies, etc. *Booklet.*

Information on any of the above offerings promptly and fully given. Address

American Express Travel Department
65 Broadway, New York

Always carry American Express Travelers' Cheques.

"The place where I was born—

"Here it is—this little town on the river—I hardly expected that this map would show it. And here is Edgerton, where I went to the County Fair that time I have told you about. It doesn't look far, does it? But it took us a whole day in the carriage, and I came back thinking I had seen the World!"

On some RAND McNALLY Map or Globe, each man can place his finger and say, "Here I was born. At one time this little dot was my World."

How that boyhood World has grown! Now it embraces great cities, states and rivers—perhaps even oceans and continents—where once it included only streets and houses or quiet country lanes and farms.

However broad or limited a man's experience, he has found one agency before him, providing a faithful picture of the paths he was to choose. In an unusually high, specialized sense RAND McNALLY & COMPANY are the makers of everybody's world.

A change in a road or a change in a national boundary—the shifting of a stream's channel or the opening of a new route of world trade—are developments which this organization is equally alert to note and record.

It is only by this eternal vigilance in matters small and great that the name RAND McNALLY has come to be a synonym for Maps.

RAND McNALLY & COMPANY

Map Headquarters

Dept. D-H

536 S. Clark Street, Chicago — 42 E. 22nd Street, New York

Branches: Philadelphia . . Washington . . Boston . . Buffalo . . Pittsburgh
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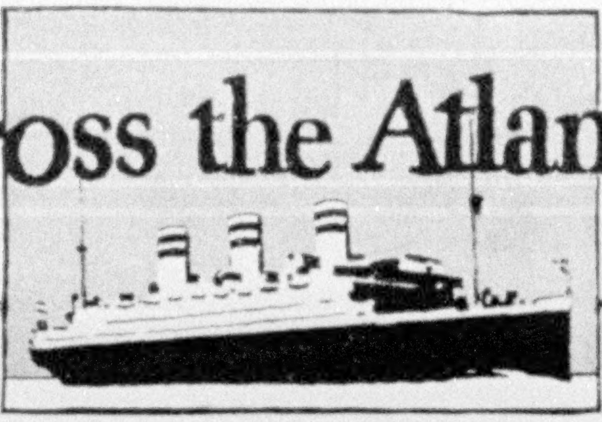


"across the Atlantic"

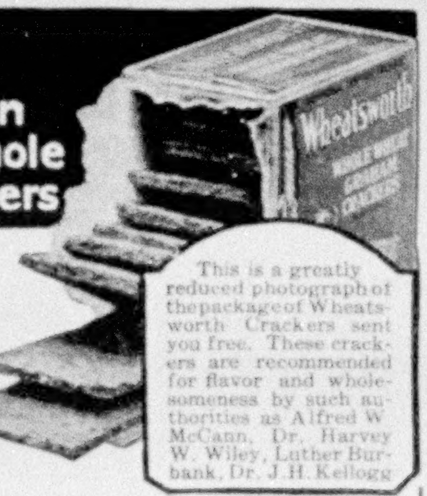
Those who have crossed before choose their ship with care

IN accommodations and in service the *de luxe* steamers RESOLUTE, RELIANCE, ALBERT BALLIN, and DEUTSCHLAND commend themselves to the most discriminating. The splendid one-class cabin steamers CLEVELAND, HANSA, THURINGIA, WESTPHALIA, and MOUNT CLAY offer appreciated economies without sacrifice of comfort. Frequent sailings from New York to Cherbourg, Southampton and Hamburg, with rail connection to all parts of Europe.

For full sailing schedule and descriptive booklet EN apply to

UNITED AMERICAN LINES, 39 Broadway, New York, 171 W. Randolph Street, Chicago, 230 California Street, San Francisco

UNITED AMERICAN LINES
(HARRIMAN LINE)~*joint service with*
HAMBURG AMERICAN LINE



FREE Eleven Delicious Whole Wheat Crackers

Build Strength
Protect Health
Good for you
Good for the Children

This is a greatly reduced photograph of the package of Wheatsworth Crackers sent you free. These crackers are recommended for flavor and wholesomeness by such authorities as Alfred W McCann, Dr. Harvey W. Wiley, Luther Burbank, Dr. J.H. Kellogg

WE want you to try **Wheatsworth** Whole Wheat Crackers at our expense, because we want to prove to you how wonderfully delicious and nourishing they really are. **100 per cent body and brain food** in tempting cracker form—nut-sweet, crisp and fresh. Taste them for yourself. **Enjoy them** with tasty fillings of butter, peanut butter, cheese, jelly or jam; break them in a bowl of milk; or eat them plain—right from the box. The children, too, will love them. **Right now,** while you think of it, **mail this coupon** with 4 cents in stamps to cover postage, and the special **free** trial package will be sent by return mail.

FREE SAMPLE
F. H. BENNETT BISCUIT CO.
132 Ave. D, Dept. D, New York City:

I enclose 4 cents in stamps to pay for postage on Free Sample Package of Wheatsworth Whole Wheat Crackers, to be sent me promptly at address here given.

Name..

Address..

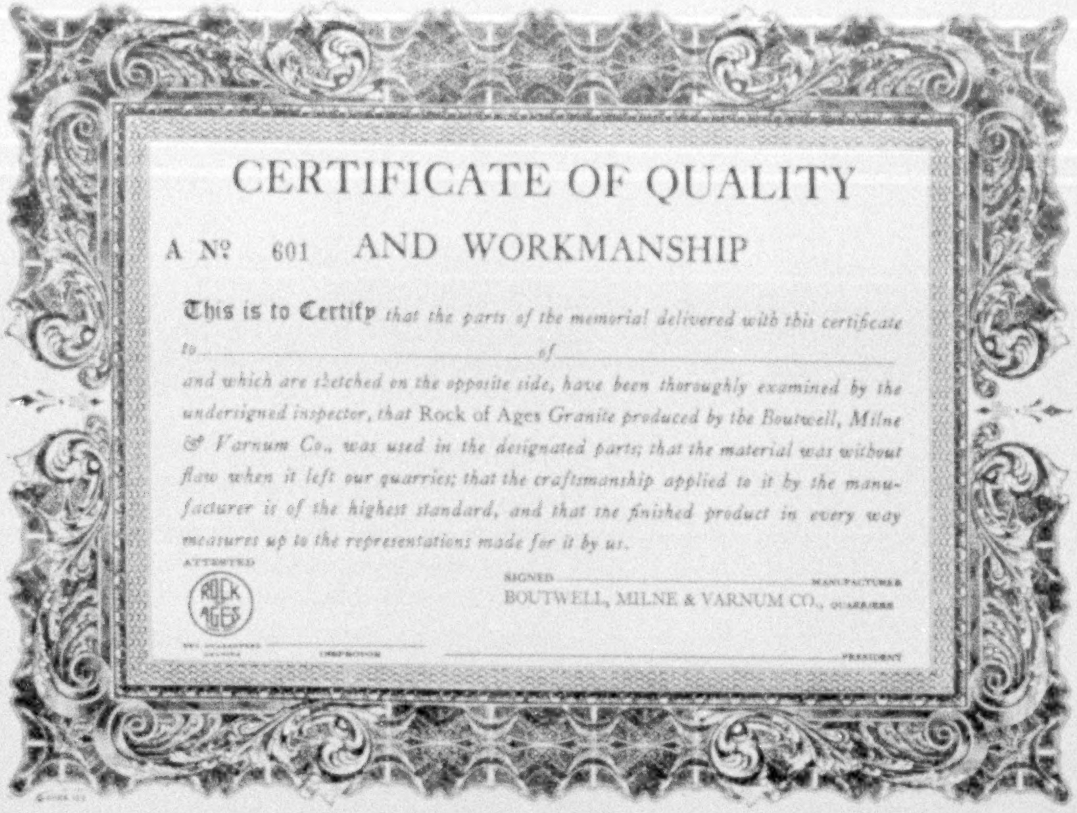
Plan well and spend wisely

If American visitors to Britain would plan their tour half as efficiently as they plan their business affairs, they would see more and their money would go further. It's Ketcham's business to help you.

Communicate with
KETCHAM

GENERAL AGENT:
LONDON & NORTH EASTERN RLY.
311 Fifth Avenue (at Thirty Second St.)
New York

Write or call for free Literature



CERTIFICATE OF QUALITY

A №. 601 AND WORKMANSHIP

This is to Certify *that the parts of the memorial delivered with this certificate to ______________ of ______________ and which are sketched on the opposite side, have been thoroughly examined by the undersigned inspector, that* Rock of Ages *Granite produced by the Boutwell, Milne & Varnum Co., was used in the designated parts; that the material was without flaw when it left our quarries; that the craftsmanship applied to it by the manufacturer is of the highest standard, and that the finished product in every way measures up to the representations made for it by us.*

ATTESTED

ROCK AGES

SIGNED ______________ MANUFACTURER

BOUTWELL, MILNE & VARNUM CO., QUARRIERS

______________ INSPECTOR

______________ PRESIDENT

A fac-simile of the certificate that protects the purchasers of Rock of Ages Granite.

Rock of Ages

The Guaranteed Granite

The Certificate of Quality identifies Rock of Ages as the granite that is inspected and guaranteed—this insures you against inferior material.

That none but perfect memorials may bear the Rock of Ages' name, infinite care is taken in the quarrying and shaping of every monument, and with each there is furnished a certificate of genuineness and perfection if requested when placing order with your local memorial merchant.

Dignity of polished or hammered surface and matchless gray color make Rock of Ages America's finest monumental granite.

That your own memorial may best express your individuality—plan it during your lifetime. It will then be truly representative.

Booklet "E" on Request

Boutwell, Milne & Varnum Company

Quarriers—Rock of Ages

Montpelier - - - - Vermont

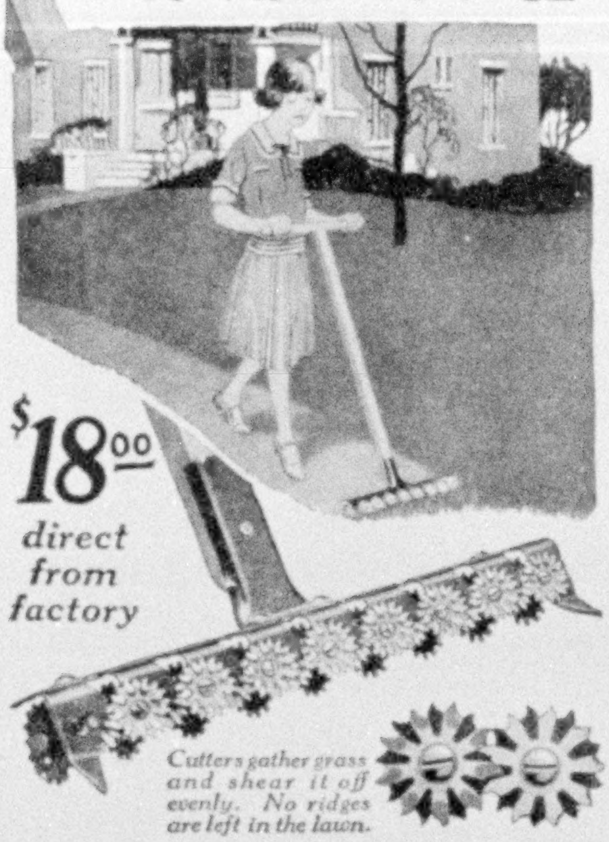
A Granite of

Nature's Own Coloring

"Quarries at Barre, Vermont."

ROCK OF AGES TRADE MARK

New Simplified Lawnmower



$18.00 direct from factory

Cutters gather grass and shear it off evenly. No ridges are left in the lawn.

MONTAMOWER

Trims and Cuts at Same Time

Ten years have been spent in developing the new MontaMower—now guaranteed mechanically perfect. Designed to trim close to walls, trees, shrubs, etc.—*No handwork necessary.* Does not pick up stones, twigs, etc. Thousands of satisfied owners.

Simple, Durable and Different

No gears—no long blades to break or get out of order. Eight pair of cutters driven by eight wheels gather and cut the grass. ***Handles as easily as a rake***—Weighs only 7½ lbs. Any woman or child can easily operate it. Particularly suitable for steep lawns and terraces. ***Easily kept sharp***—MontaMower cutters resharpen themselves like scissors—they will last from two to four years. At end of that time cutters can be replaced by new ones at no more expense than sharpening ordinary lawnmower.

MontaMower has one qualification in common with other lawnmowers. It will not give efficient service on sandy, loose, very wet or swampy ground—nor is its use recommended for high, tough grass or thick weeds.

ORDER A MONTAMOWER TODAY

If your dealer cannot supply, send check or draft for $18 direct to factory. Guaranteed to be as represented or money refunded. Delivery charges prepaid if remittance accompanies order. Delivery guaranteed on date specified in your order.

MONTAGUE MFG. CO.
148-152 Louis St. Grand Rapids, Mich.

— MAIL COUPON TODAY —

Enclosed find remittance of $18.00. Please send one MontaMower to this address on or about.

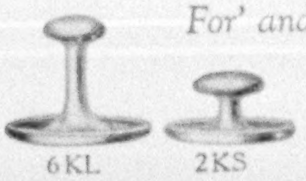
.... date

Name ....

Address ....

Krementz

For' and Aft' Set



2 in box, 75c
Buttons separately, 25c each

Faithful Servants

Not only do Krementz Collar Buttons serve you economically, but they serve you well. Your appreciation of them grows with the years. Upon them daily wear and tear leaves no mark. They will be with you to the end, even though you complete your allotment of three score and ten.

Write for literature illustrating the complete Krementz line of correct jewelry for men.

KREMENTZ & CO., Newark, N. J.

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ROSE GARDENS

In old-fashioned gardens, in borders, along garden walks, or on arbors, the sweet perfume of blooming roses is a source of constant delight.

We make a specialty of roses for garden and home planting, and our assortment has been made up especially for that purpose and includes only such varieties as will thrive under home conditions and have proved satisfactory.

Send your name for a copy of our beautiful Catalogue and Planting Guide;—38 pages, over 50 illustrations,—roses, shrubs, vines, evergreens, perennial plants, fruit, nut, and ornamental trees. Just ask for Catalogue "P."

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GLENWOOD NURSERY
Rochester New York
"FAMOUS SINCE THE SIXTIES"

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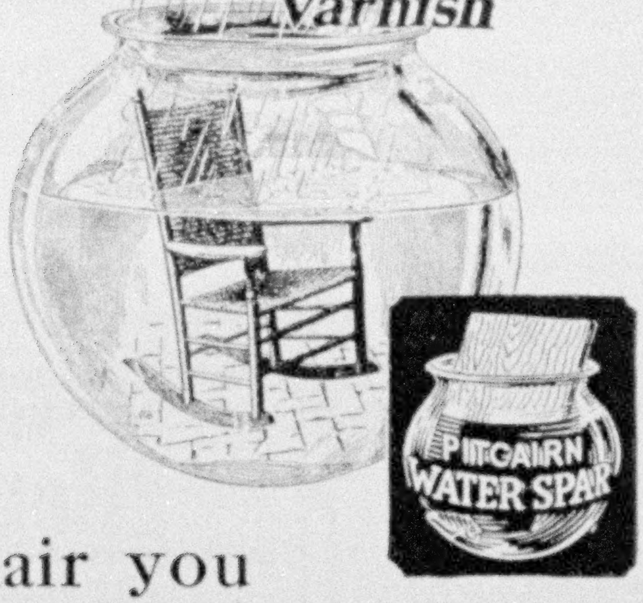
PITCAIRN

Water Spar

Varnish



The chair you forgot to bring in

WHEN you forget to bring your porch furniture in and it gets caught in the rain, does the varnish turn white? Does it crack and peel off?

If it has been finished with Waterspar it will not discolor, will not deteriorate even when soaked in water.

Think what the Waterspar test means to furniture and floors. The Watersparred panel of wood that remains in the aquarium day in and day out is water-proof.

Besides transparent Waterspar there are also eighteen beautiful colors of Waterspar colored varnish and enamel.

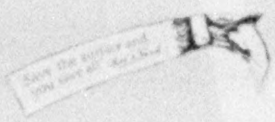
Waterspar Varnishes are "Pittsburgh Proof Products." There is the same high standard quality in the other "Pittsburgh Proof Products," among them Banzai Enamel, Sun-Proof and Velumina, the wall paint you can wash. Whatever you need in the way of glass, paint, brushes or varnish the Pittsburgh Plate Glass Company has a product that will exactly fill your requirements. For sale by quality dealers everywhere. The Advisory Board helps manufacturers solve unusual paint and varnish problems.

What color shall the new living-room rug be? What will best harmonize with the rest of the decorations? Send for the book, "What to do and How to do it." A guide to better homes. It contains many helpful hints. Send ten cents to Dept. C, Pittsburgh Plate Glass Company, Milwaukee, Wis., for your copy.

PITTSBURGH PLATE GLASS CO.

GLASS — Manufacturers — PAINT

Paint and Varnish Factories Milwaukee, Wis. - Newark, N.J.


Save the surface and you save all

Varnish

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The Newport of the Argentine

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Then make your plans now for a trip to South America. It takes only 12 days, and is surprisingly inexpensive on the great new U. S. Government ships of the Munson Line. They sail every two weeks from New York to Rio de Janeiro, Santos, Montevideo and Buenos Aires and are the finest and fastest ships on the route. Tours around South America conveniently arranged. Investigate without obligation today. Send for your Government's free illustrated literature.

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ventilating screen lets the air in.

For Comfort and Health

The air circulates inside your cap and keeps your head cool. Makes for comfort, health and happiness. At fine stores, $2 to $5. For names of dealers nearest you, write us at 210 Fifth Ave., New York.

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REG. U. S. PAT. OFFICE
The AIR COOLED CAP

Isn't He the Picture of Contentment?

It is so easy to keep your dog happy and healthy simply by feeding him regularly on SPRATT'S Dog Cakes and Puppy Biscuits. SPRATT'S foods appeal to the tastes of all dogs. They are a complete diet and not mussy to feed.

Don't disappoint your dog. Get the *genuine* SPRATT'S. If your dealer cannot supply you, send for sample and enclose 2c for new book, No. G44, on feeding.

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SPRATT'S

DISPLAY YOUR MAPS

Pin them tightly to your walls without injuring the map, the wall paper, plaster or woodwork, with

Moore Push-Pins
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For heavy pictures, mirrors or other wall ornaments in the library or any room in the house, use

Moore Push-less Hangers
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10c pkts. Sold everywhere. In Canada, 15c.

MOORE PUSH-PIN CO.
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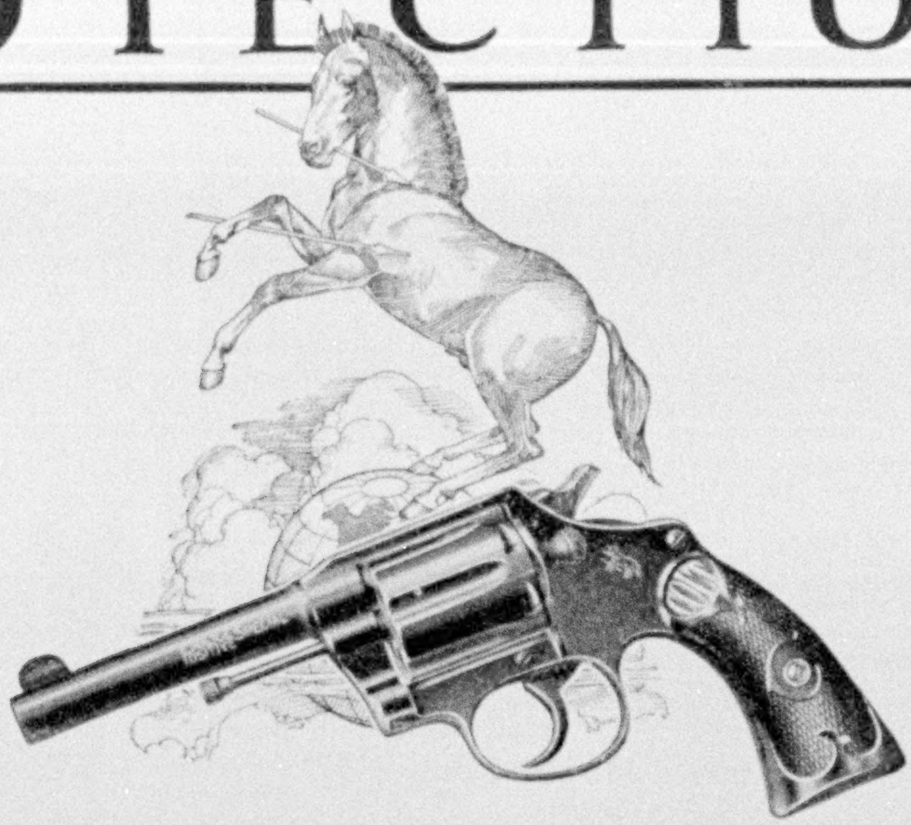


BECAUSE Colt's Fire Arms have always been *safest* to handle and carry—because they get into action *quickest* when quickness is vital—because their fire is *sure* and *accurate*—they have won Government and Police endorsement for nigh on a century. Protection is only *complete* when *all* these qualities are present; so make sure of Colt security for your home by possessing a revolver or automatic pistol bearing this time honored name. Ask your Hardware or Sporting Goods dealer to show you his full line of Colt's fire arms. They're reasonably priced.

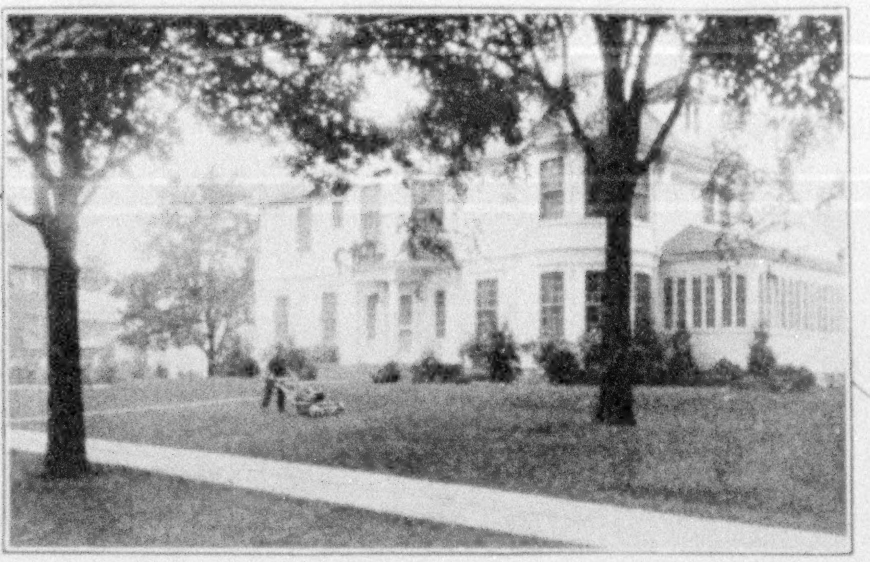
Catalogue? Of course. Want it?

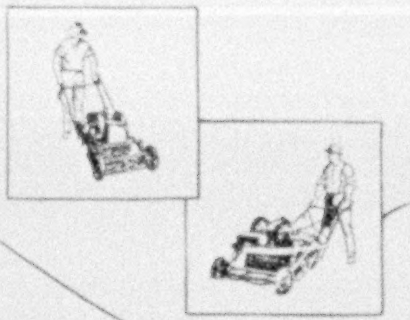
Colt's Patent Fire Arms Mfg. Co.
Hartford, Conn.

Pacific Coast Representative
Phil. B. Bekeart Co., 717 Market St., San Francisco, Calif.

COLT'S

THE ARM OF LAW AND ORDER





MORE than twelve thousand Ideal Power Lawn Mowers are now in use. This number is greater than that of all other makes combined. Such leadership means that you can purchase an Ideal with the same confidence you would a motor car of established reputation.

The Ideal offers a combination of mechanical refinements found in no other. Timken bearings, Alemite lubrication, alloy steels, an absolutely dependable power plant—these and other features have been thoroughly tested over a period of twelve years. To make certain of getting a mower that will serve you faithfully season after season, buy an Ideal and be sure. Literature describing three models on request.

IDEAL
Power Lawn Mowers

Ideal Power Lawn Mower Company,
R. E. Olds, Chairman
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....192

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(This information is important for the records.)

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for membership in the Society.

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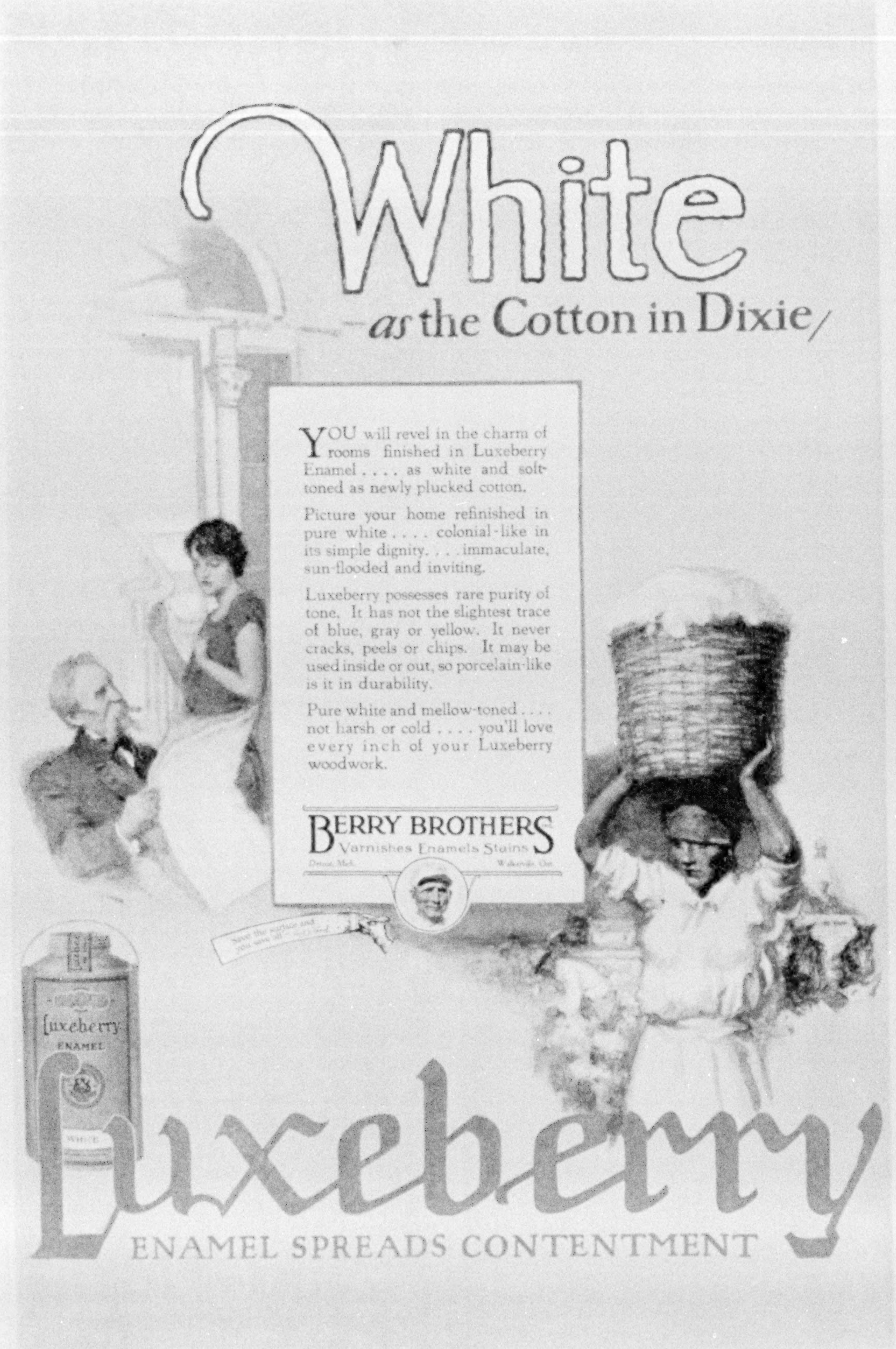
Name and Address of Nominating Member

4-24



White *as* the Cotton in Dixie/

YOU will revel in the charm of rooms finished in Luxeberry Enamel . . . . as white and soft-toned as newly plucked cotton.

Picture your home refinished in pure white . . . . colonial-like in its simple dignity. . . . immaculate, sun-flooded and inviting.

Luxeberry possesses rare purity of tone. It has not the slightest trace of blue, gray or yellow. It never cracks, peels or chips. It may be used inside or out, so porcelain-like is it in durability.

Pure white and mellow-toned . . . . not harsh or cold . . . . you'll love every inch of your Luxeberry woodwork.

BERRY BROTHERS
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Luxeberry
ENAMEL SPREADS CONTENTMENT

A WARM HOUSE WHEN YOU ARISE

Chamberlin Inside Door Bottoms enable you to admit fresh air to any part of the house while sealing all other parts against drafts. Thus when you sleep with open windows the other part of the house is not chilled. Inexpensive to install, separately or in conjunction with Chamberlin Metal Weather Strips. Just send the coupon.

Keep Warm, Save 25% to 40% on Fuel, End Draughts, Keep Out Dirt and Dust

This Inexpensive Way—Just Send the Coupon

TESTS show the enormous waste of heat at unprotected doors and windows.

Chamberlin Metal Weather Strips permanently end all that. They save 25% to 40% on fuel.

Learn how little it costs to seal your house against cold, and wasteful loss of heat. We give estimates free. Simply send the coupon. Chamberlin Metal Weather Strips mean comfortable, even heating in all parts of the house. No cold spots. No draughts to drive you from choice, cheerful places at the window.

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Windows and doors operate more easily. They cannot rattle or stick with Chamberlin strips.

ALL DONE BY OUR OWN EXPERTS

Chamberlin's own experts fit and install all Chamberlin Metal Weather Strips, without muss or inconvenience to the household. It is specialized work, requiring special training and tools. And because we know installations are made right, we guarantee them for the life of the building.

Keep Out Draughts for Early Morning Comfort

CHAMBERLIN

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Chamberlin Metal Weather Strips are used in most weather-stripped buildings, including homes, banks, schools, office buildings, churches, stores, hotels and apartments. Don't hesitate to ask for an estimate. The figures submitted will be definite and accurate because they are compiled by men who know every detail of this business.

Chamberlin Metal Weather Strip Company, Detroit, Michigan

Chamberlin Metal Weather Strip Co., Detroit, Mich.:

I would like an estimate covering the cost of installing (check which)

Chamberlin Inside Door Bottoms—

Chamberlin Metal Weather Strips—In my home—Office Building—

Church—Number of Windows—Number of Doors—

Name ....

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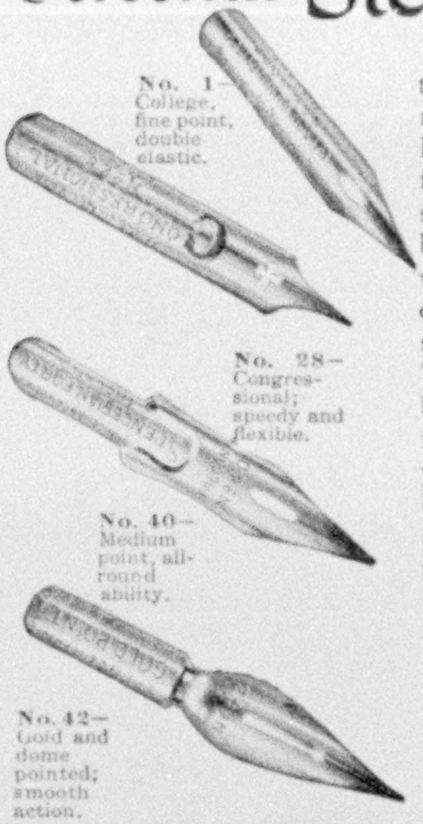
City and State ....

Eng. Dept. A9

Spencerian

Personal Steel Pens


No. 1—
College, fine point, double elastic.
No. 28—
Congressional; speedy and flexible.
No. 40—
Medium point, all-round ability.
No. 42—
Gold and dome pointed; smooth action.

Getting right down to the point—Spencerian Personal Steel Pens are fashioned from finest quality steel into the longest lasting, smoothest-writing pens that you can buy. Made by seven hand processes! That's why they've been the standard for more than fifty years. And remember there is an exact style for *your* particular handwriting.

SPENCERIAN PEN CO.
349 Broadway
New York

A sample card of one dozen assorted pens for a dime.

stains vanish

Sani-Flush cleans the toilet bowl without scrubbing. Simply sprinkle it into the bowl, follow directions on the can, and flush.

Spots and stains vanish. The porcelain glistens. The hidden, unhealthful trap, too, is cleaned, purified and made sanitary. Sani-Flush destroys all foul odors.

Always keep it handy in the bathroom.

If not at your grocery, drug or hardware store, send 25c for a full-size can.

THE HYGIENIC PRODUCTS CO.
Canton, Ohio

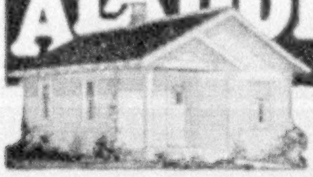
Sani-Flush

Reg. U.S. Pat. Off.

Cleans Closet Bowls Without Scouring

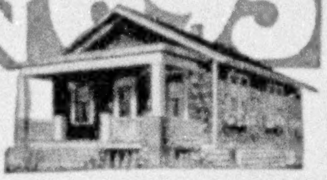
5-Room $548 ALADDIN

We Pay the Freight



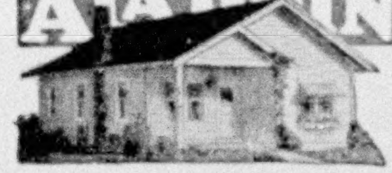
You can buy all the materials for a complete home direct from the manufacturer and save four profits on the lumber, millwork, hardware and labor.

6-Room $695 ALADDIN



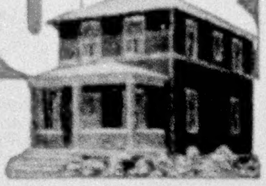
Living room, dining room, 2 bedrooms, kitchen, bath. 4 other plans, some with pantries, dining alcoves, grade and inside cellar entrances. Get free Aladdin Catalog.

7-Room $975 ALADDIN



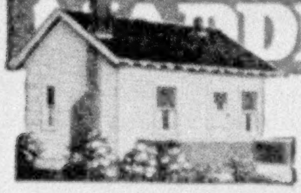
Aladdin catalog contains seven different plans of this house; some with inset porches, grade and inside cellar entrances, two and three bedrooms.

7-Room $1,068 ALADDIN



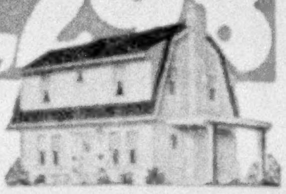
Large living room, dining room, kitchen, pantry, three bedrooms, clothes closets, bath. Semi-open staircase and rear porch. Four-bedroom plan with grade cellar entrance at same price.

4-Room $414 ALADDIN



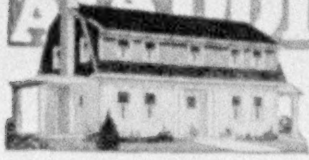
Here's your opportunity to avoid high apartment rentals. Build this home yourself. Two men can build it in a week. Our instructions explain every step. Five plans shown in Aladdin catalog.

7-Room $1,298 ALADDIN



Dutch Colonial with full ceilings first and second floors. 14' x 22' living room, large dining room, kitchen, three bedrooms, bath, linen and clothes closets; grade cellar entrance.

12-Room $1,932 ALADDIN



Dutch Colonial for wide inside lots or narrow corner lots. Full ceiling heights entire second floor, sewing room, columned and inset front entrance. Get Money-Saving Aladdin catalog.

Price includes all lumber cut to fit; highest grade interior woodwork, siding, flooring, windows, doors, glass, paints, hardware, nails, lath, roofing, with complete instructions and drawings. Freight paid to your station. Permanent Homes—NOT PORTABLE. Many styles to choose from. Write nearest mill today for FREE Money-Saving Aladdin Catalog No. 358.

The ALADDIN Co., BAY CITY, MICHIGAN

Wilmington, North Carolina; Portland, Ore.; Toronto, Ont.

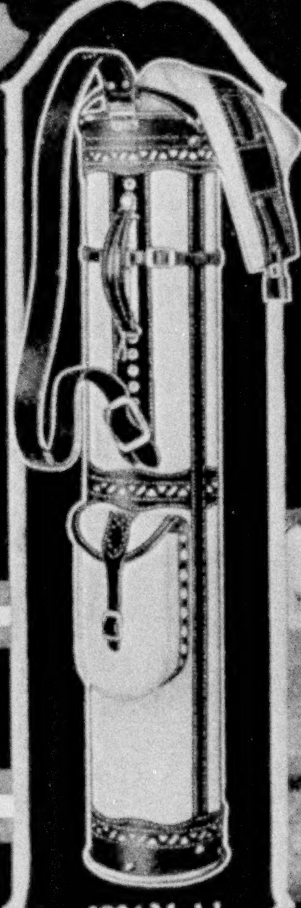
The New 1924

TRADE MARK REGISTERED

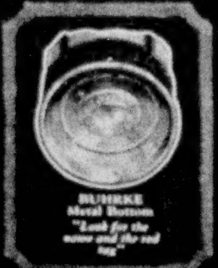
BUHRKE

Pronounced BURR-KEY

Golf Bag



1924 Model



BUHRKE
Metal Bottom
"Look for the name and the red tag"

ACCURATE putting, straight, strong drives—everything that insures low totals on your score cards depends on supple, unstrained muscles. The new model Burr-Key Golf Bag—

Equipped with the IMPROVED BURR-KEY Adjustable Handle and Metal Top

—can be carried with the arm extended and completely relaxed, preventing fatigue and overstrain. Other exclusive Burr-Key features are the Metal Bottom, Locked Pocket, Towel Clip, New Shoulder-Strap Fastener and Partition Arrangement.

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New York Office and Showroom: 258 Broadway
Manufactured in Canada by Woods Manufacturing Co., Ltd.
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A Garden Full of Gladioli for $2.00

The Gladiolus is one of the most satisfactory flowers grown, and there is no reason why every family cannot enjoy this grand flower—it is as easy to grow as the potato.

Blooms from July to frost if you plant a few bulbs each month from April to July.

For **Two Dollars** we will send **50 Bulbs** of our **Grand Prize** Mixture, which covers every conceivable shade in the Gladiolus kingdom.

Each year we sell thousands of these bulbs and have received numerous testimonials as to their merits.

Order Your Bulbs Now, so as to have them to plant when you begin making your garden.

Simple cultural directions with every package

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Our 1924 Spring Seed Annual sent on request

Stumpp & Walter Co

30 and 32 Barclay Street New York

They said
we couldn't do it for $1

But we do!

Send us your name and address and we will print it in beautiful Gothic letters on National Bank bond paper 6 x 7 inches.

200 sheets and 100 envelopes for $1

Business men, society women, housewives, students use this paper. Write your name and address plainly on slip of paper, tuck it in an envelope with $1.00 and we will ship you your stationery within a week. Or if you prefer, we will ship C. O. D. West of Denver and outside U. S., add 10% extra. We'll refund your money gladly if you aren't wholly satisfied.

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500 Park Ave., Peru, Ind.

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Wherever there is big business, there you will find the Mongol Pencil—

The Nation's Standard

Eberhard Faber
The Oldest Pencil Factory in America
ESTAB NEW YORK 1849

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BLACK TIP
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Spring-Summer, 1924

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$8.00
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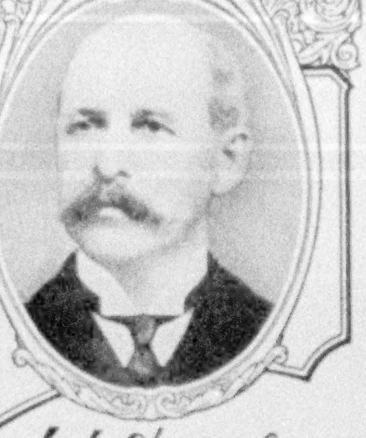
$7.00 and $8.00 SHOES

Many at $5 & $6 – Boys' at $4.50 & $5

W. L. Douglas name and portrait is the best known shoe trade-mark in the world. It stands for a high standard of quality and dependable value. For economy and satisfactory service wear shoes that bear this trade-mark



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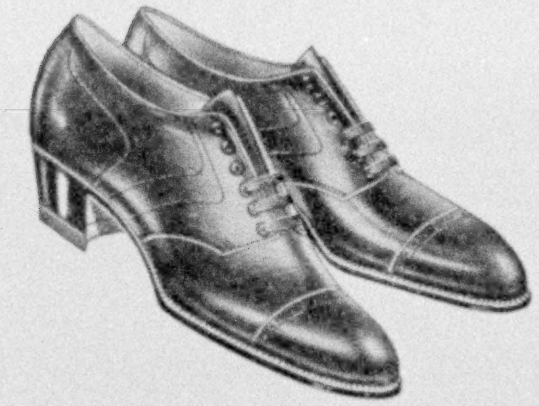
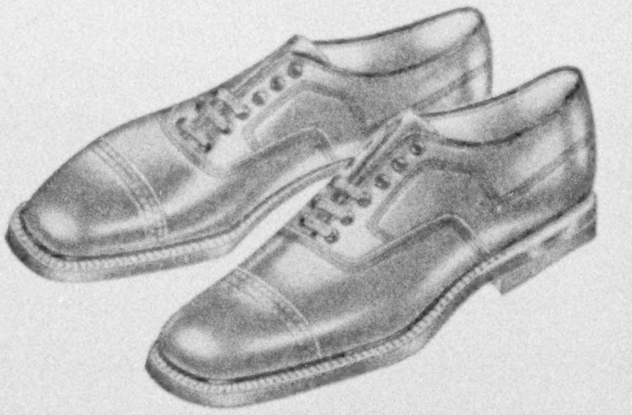


W. L. Douglas "CORFLEX"
for Women

Made of a fine grade of Brown Kid, also Black Kid, in Blucher Oxford pattern. A very neat model of the corrective type with splendid fitting qualities. The corset effect gives COMFORT and SUPPORT to the ARCH. Exceptional service at a low price, **$7.00.**



Campus

A bright tan Russia Calf Oxford for Men on a wide brogue last. New, attractive pattern with black stitching and eyelets. Patent Leather Cork Welt and trimming around top; rolled heel. A smart, up-to-the-minute style for Spring and a wonderful value. **$8.00.**

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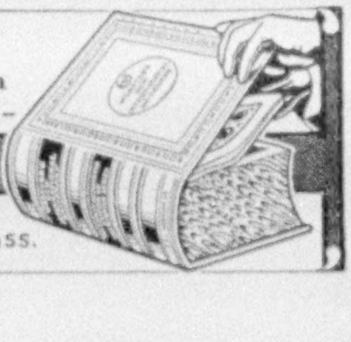

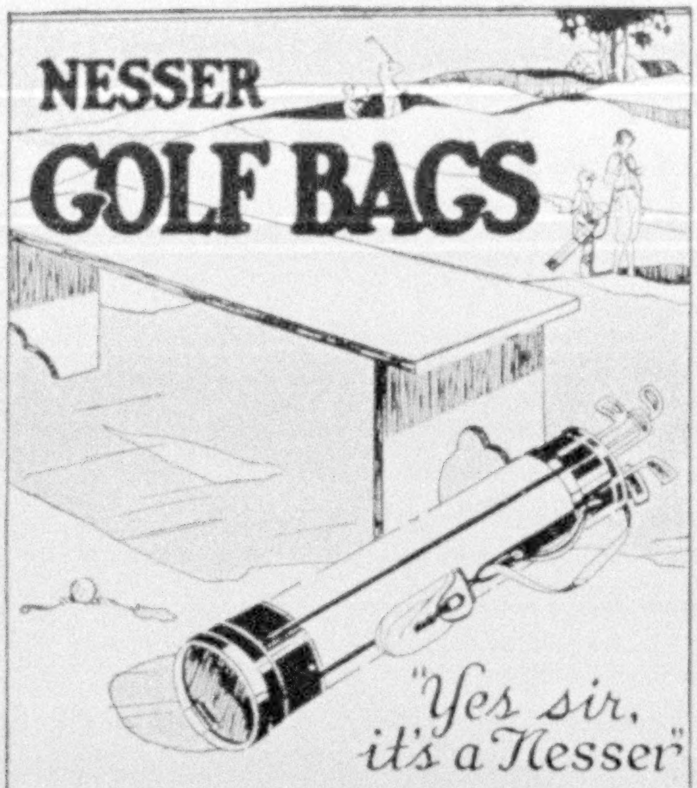
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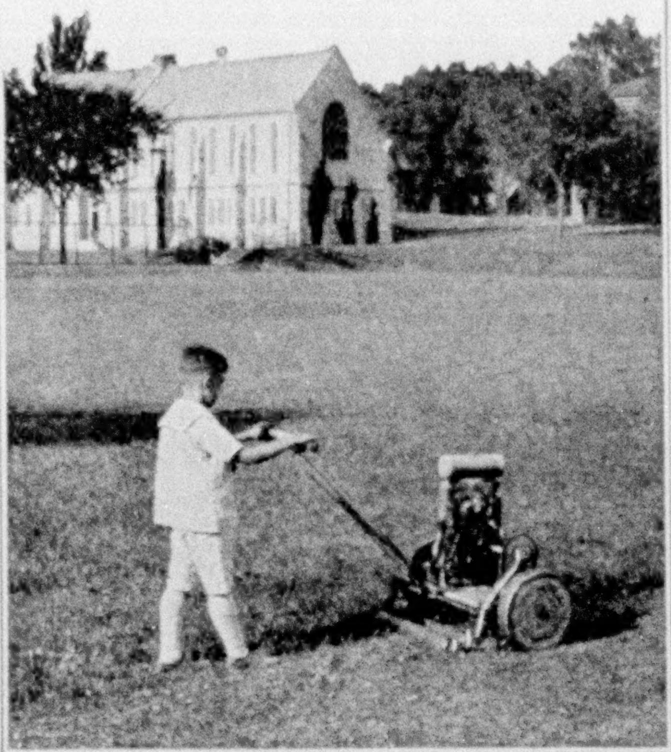

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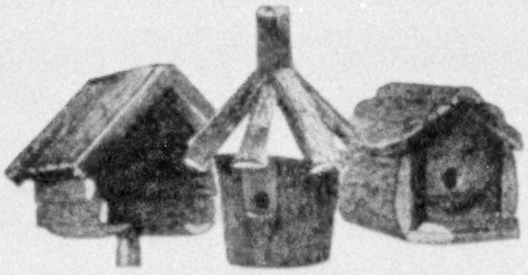

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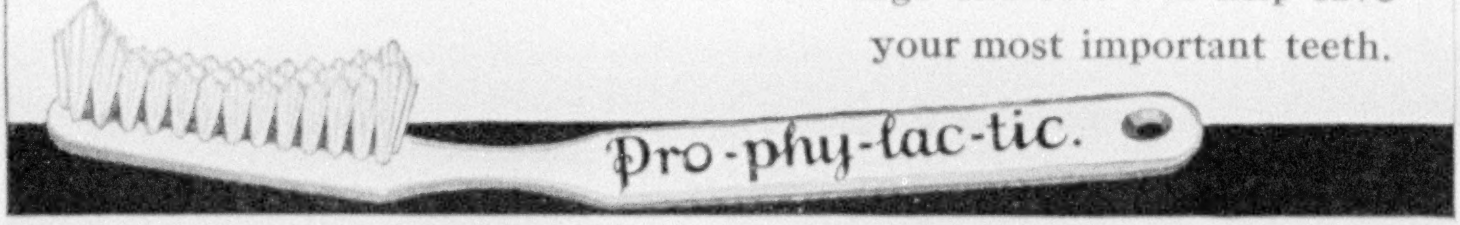
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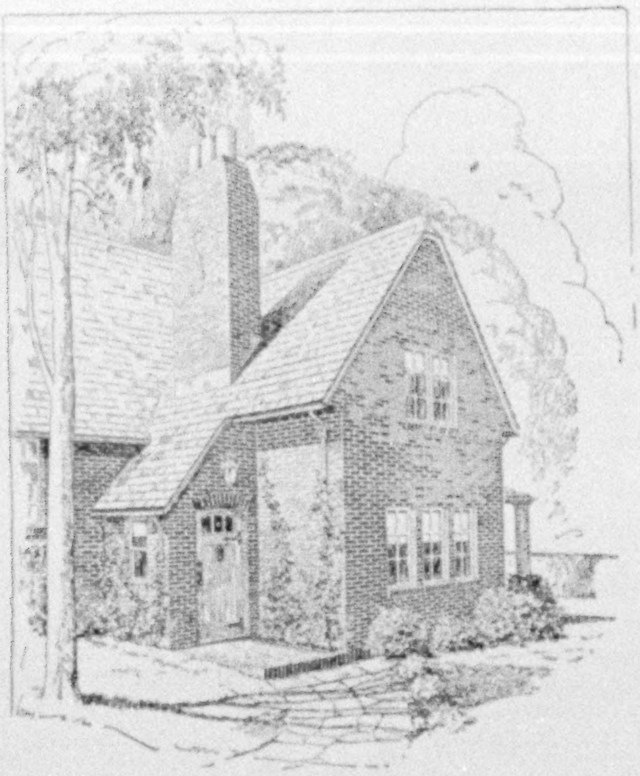

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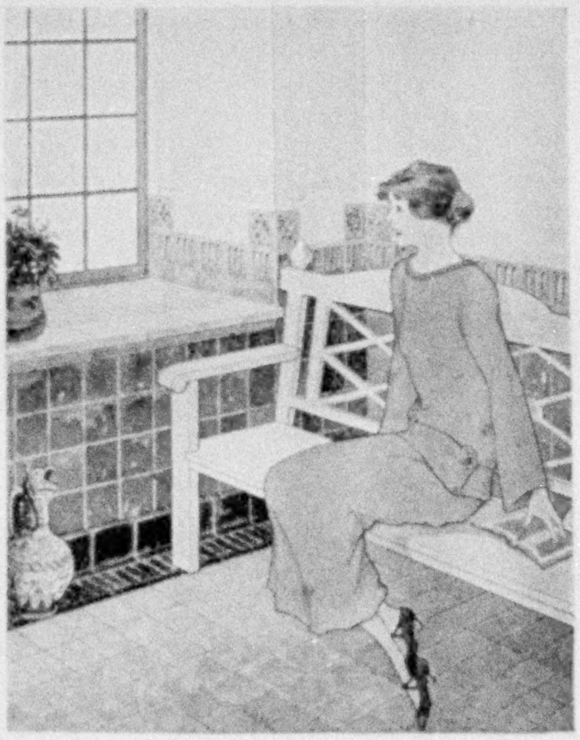

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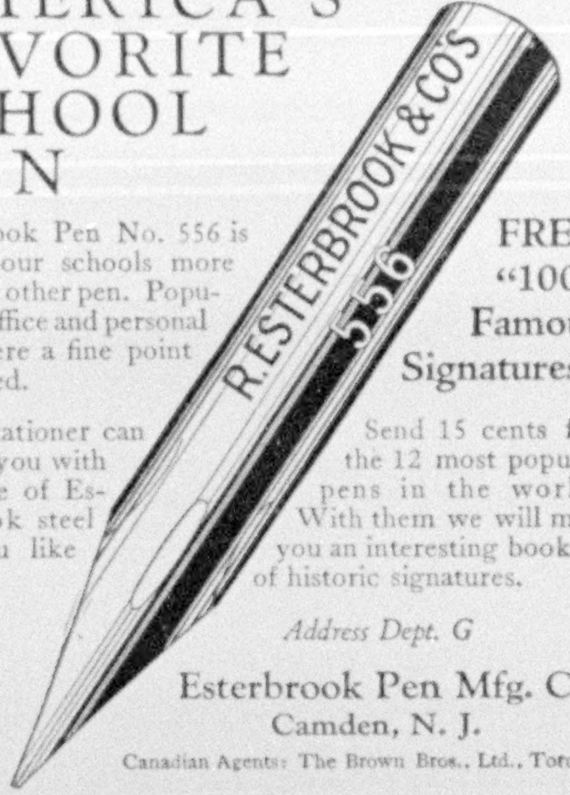

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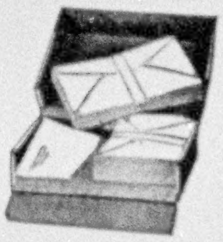

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Lead exempts you from a weather tax

How much is your weather tax? Thousands of owners in the United States pay such a tax for the share of rain, snow, and sunshine that fall on their properties.

One billion dollars' worth of property crumbles beyond repair in this country each year. And this vast total includes the many millions paid by property owners as weather tax—money that lead would help to save.

How lead exempts you

Lead performs many functions—for which the other metals are not suitable. In the form of white-lead in paint it is man's mightiest protector of wooden and non-metallic surfaces.

Approximately 350,000,000 pounds of white-lead are used every year in this country. This makes enough paint to cover with one coat about 3,000,000 houses of average size.

Wise property owners everywhere are obeying the rule, "Save the surface and you save all," and are covering the surfaces of their properties with white-lead paint.

For exterior painting they find that white-lead and pure linseed oil make a paint that is impervious to moisture, and lasts long.

For interior painting of walls and woodwork these owners find that white-lead mixed with flatting oil not only protects the surface but also gives a soft, beautiful finish.

Producers of lead products

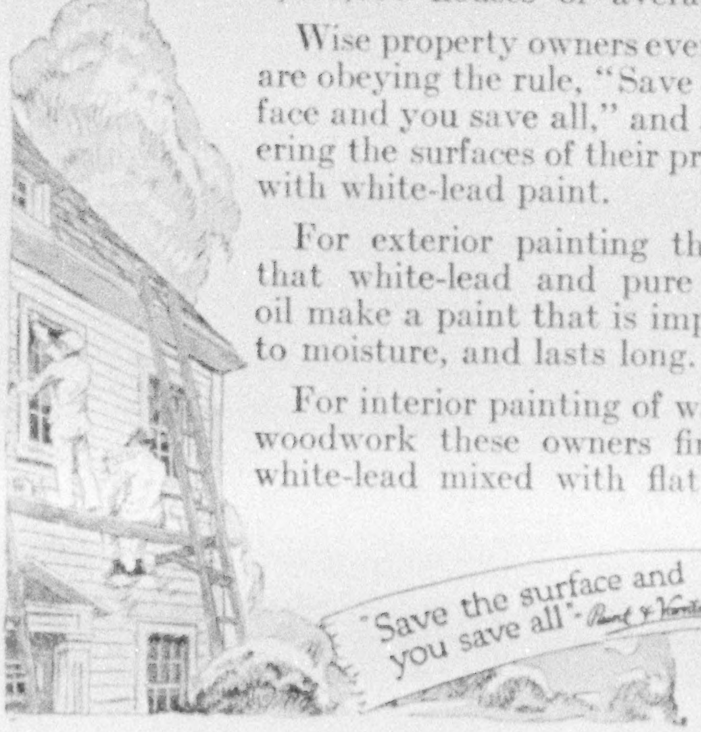
National Lead Company makes lead products for practically every purpose to which lead can be put in art, industry and daily life.

Dutch Boy white-lead is the name of the pure white-lead made and sold by National Lead Company. It is extremely fine—so fine it flows through a silk screen containing 27,000 holes to the square inch. This insures a solid, dense paint film.

Every keg of *Dutch Boy white-lead* bears the Dutch Boy trademark—a guaranty of highest quality. Dutch Boy products also include red-lead, linseed oil, flatting oil, babbitt metals, and solder.

If you are interested in painting, send for portfolio, "The Decoration of Our Homes."

Besides its use in paint, lead has many other interesting uses. If you want to know more about this wonder metal, we can recommend a number of interesting books. The latest and probably most complete story of lead is "Lead, the Precious Metal," published by the Century Company, New York. Get it at your book store, or write us or the publisher.


"Save the surface and you save all"-Paint & Varnish

NATIONAL LEAD COMPANY

New York, 111 Broadway; Boston, 131 State St.; Buffalo, 116 Oak St.; Chicago, 900 West 18th St.; Cincinnati, 659 Freeman Ave.; Cleveland, 820 West Superior Ave.; St. Louis, 722 Chestnut St.; San Francisco, 485 California St.; Pittsburgh, National Lead & Oil Co. of Pa., 316 Fourth Ave.; Philadelphia, John T. Lewis & Bros. Co., 437 Chestnut St.

PRIDE OF CLEANLINESS

The modern bathroom is one of Youth's great teachers. Spotless tiling, shining mirrors, and softly gleaming, snowy fixtures are pages in a textbook which teaches the lifelong lesson of pride of cleanliness.

With old and young alike there is an almost instinctive appreciation of the moral importance of the bathroom. And there is a universal desire for finer bathrooms and for enough bathrooms for all the household. To satisfy that desire many people turn naturally to Kohler Enameled Plumbing Ware. They know, when they see the Kohler name peering out from beneath the snowy enamel of a Kohler "Viceroy" built-in bath or a Kohler lavatory, that they are looking at the best that can be made.

There are good plumbing dealers in every city who can tell you all about the good products of the half-century-old house of Kohler of Kohler. And they will tell you what you will not be displeased to learn—that Kohler Ware is not more expensive than any other ware that you would care to own. May we send you the Kohler booklet?

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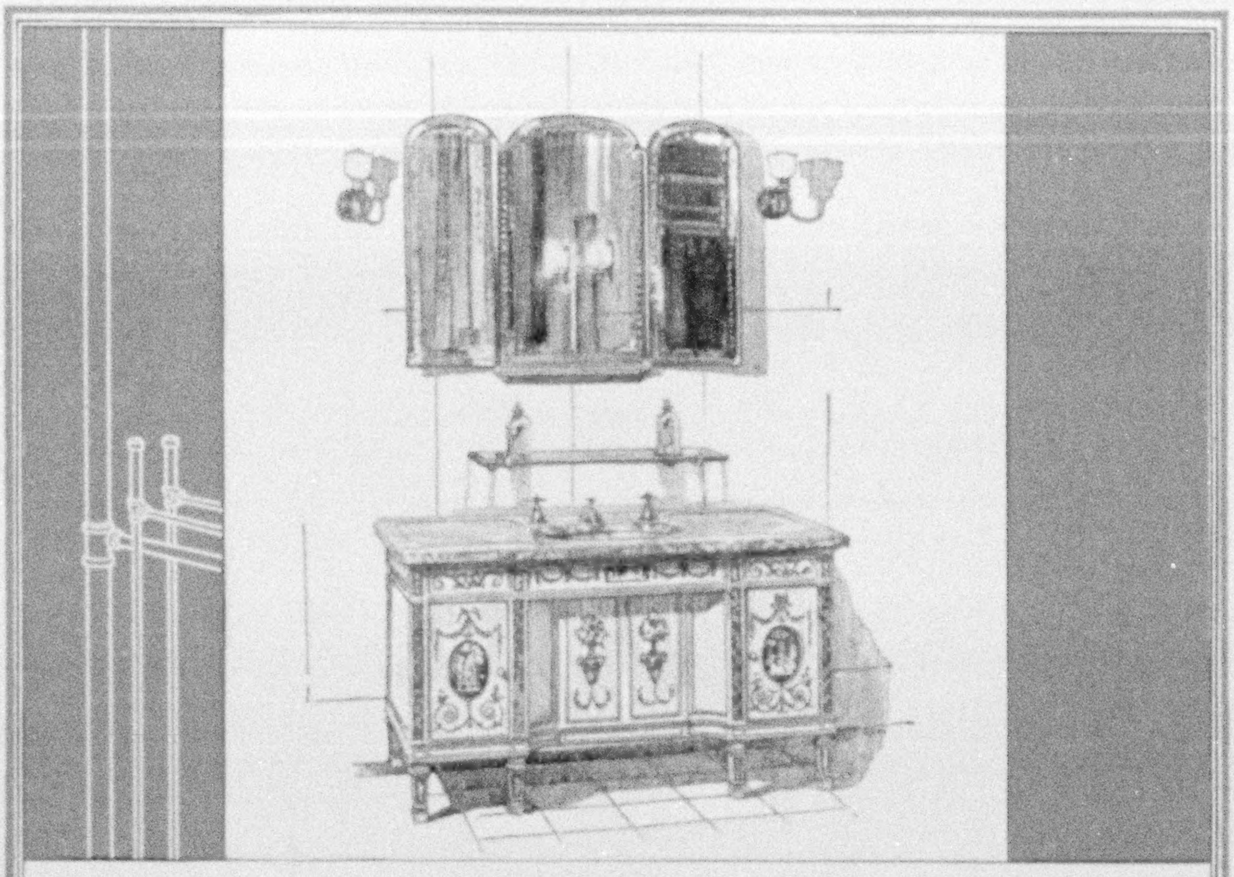

CRANE BEAUTY IN THE OPEN; CRANE QUALITY IN ALL HIDDEN FITTINGS

Introduction of charming color and line into the bathroom of today has been effected by the taste and skill of Crane designers. The commode lavatory shown above is of imported "fleur de peche" marble, on a hand wrought 18th Century Italian cabinet, finished in soft gray green, black, rose and gold. Behind the panels at either side are cabinets for toilet articles, with drawers above. This is only one unit from the complete and interesting line of bathroom appointments and plumbing and heating materials Crane provides to meet the needs and opportunities of the simplest and most luxurious houses, apartments and hotels.

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